пустыня змея (*.jpg *.png *.bmp)

Link: Go here for Linux "SidewinderPhotoColourBalancer F2-C17" 19 Oct 2014 download , Config. and install

(requires JVM) Java2 JRE runtime fast download

*** Note: While there have been various scandals about the Greyhound racing industry in Australia recently, Animal cruelty laws in Australia are extremely rigid compared to most other nations around the world. The only problem i consider these creatures truly have is being re-homed after they are ~~too old to race~~ past their prime for racing!

Link: Problems of Greyhound racing for Greyhounds Link: Adopted Greyhound Care

Link: Government Report 28 March 2014 (PDF) ***Greyhounds As Pets and Greenhounds***

7.7 *In 2009 GRNSW established its own re-homing program - Greyhounds as Pets (GAP). The aim of GAP is to: provide an avenue for people to adopt former racing greyhounds; educate participants on the options for their greyhound after racing; and promote the merits of greyhounds as a pet to the wider community.*

7.8 *In 2011 GRNSW and the NSW Department of Local Government launched the Greenhounds program. The Greenhounds program allows for pet greyhounds to go muzzle free in public places after they successfully complete a re-training program and are deemed suitable by an approved Greenhounds assessor. GRNSW advised that more than 200 Greenhounds are now muzzle free.350*

Greyhound re-homing sites: Link (1) : Greyound Adoption Service Link (2) : Greyound Adoption Service Link (3) : Greyound Adoption Service

Something completely different: Link (1) : Dingo Conservation (re: State/Territory keeping Laws) Link (2) : Dingo Conservation (re: State/Territory keeping Laws)

* Slackware Linux Install (Developers (or Advanced Home User) OS "KDE")
* Debian Linux Install (Desktop Workstation OS "Gnome")
* Mint Linux Install (Home User Desktop OS "Gnome")
* SteamOS Install (Gamers Workstation e.t.c. OS)
* Others - e.g. Suse , Fedora , CentOS , Red Hat... Install (User Desktop/Workstation/other e.t.c. OS)
Scientific Linux Install (R&D Enterprise and Science OS "N/A as much - runlevel")
FreeBSD-UNIX Install (Networking NFS OS "N/A")

* Rescatux Linux (bootloader Rescue/repair distro) Install (Bootloader and binaries crash rescue OS "primitive GUI")
* Configuring Linux Mozilla, Firefox , SeaMonkey
* Linux SeaMonkey Web Browser download

(D.I.Y. Article) do it yourself - How To

The Australian House "The 15 Kw house" - Solar Wind Hybrid "power system" OFF GRID

note: "all DIY" Self constructed-installed , Self Imported and self brokered kits price estimate includes batteries and tariff and transport and much of the install materials
(prices quoted by a supplier are usually in USD as an intermediary currency and require conversion)

Anyone living within 20Km of coastline (and 80 meters away from another residence) can safely use a wind solar hybrid of as little as 8Kw rating to mimic grid supply level powering because of the land-sea convection wind reliability!

You can understand it may be easier as a home buyer to incorporate the price of an off-grid system stipulated into a home loan and finding a block at least 100 meters long to build with the turbine at least 80 meters from other residences and with council building zoning allowance of off-grid equipment!

Wind Grid Tied (Domestic) DIY(except inverter wiring!!!)

CONTENTS

All Australian houses are 15Kw power system minimum
Off Grid practically by cost effective! (Batteries are what makes an off grid system)
How batteries operate
Ensuring battery service life
(Ensuring battery service life) Setting the "Dump Load" on the charge controller and Battery Life-Cycle
The problem with off grid power
A note about inverters (balancing duty load)
What does it require to operate an Australian house
Importation deals and How to talk to the supplier
Money and payment "Personal Import (CCID no ABN)"
Installing
Where to locate the Wind Turbine
Steps to Acquiring a Hybrid power system (and customs forms and info and cargo support)
Wind Solar Hybrid kits can be got as "CIF" to Sydney Port

Battery Bank Size AH-Kwh (Amprere hour - Kilowatt hours) Caculator

Why switch off the first world? because the grid is always the same size and alike petrol or anything else it is truthfully getting more expensive and as much purely unpredictable of cost in a short period of time against wages and inflation!

Anyone living within 20Km of coastline (and 80 meters away from another residence) can safely use a wind solar hybrid of as little as 8Kw rating

to mimic grid supply level powering because of the land-sea convection wind reliability!

What's the point of being Phil from energyaustralia to be there(as is in the advert) to do an air-con installation when **all someone can do to save money is "be advised to switch it off"** because it costs too much to operate so cannot use it , is essentially fossil fuel fed too!

Pre note: It is obviously possible to completely power a house "almost normally" from a combination of 5000w(washing machine - small microwave - small pluggable hot water) and 2500w(lights small fans radio) pure sine wave inverters(DC-storage to 240vAC) using only 1.5Kw to 2Kw solar and 3 of 400w-600w 12v AC turbines(rectified by a controller to the battery bank each) by changing(to smaller equipment and more jobs) many of the household job equipment capacities and managing heavy jobs at optimum weather generation time but requires switching from two banks of 4x 250ah(heavy amp throughput deep cycle by density size electrodes 70-80 Kg each) and for the 2500w 4x 80ah. E.G. An "oil column heater for winter" would require 2x 400w-600w 12v AC turbines, and ~~2x 80ah~~(requires 4x 40ah to drop battery individual output to 250 watts each max.) batteries but can only be on at 1000w-heating for 1/2 an hour with those batteries.
The only way to control and reset the point against failable human memory is a "power point timer switch" betwixt inverter'n apply'!
Inversely for twelve volt system, 1Kw of panels and 2x 400w-600w 12v AC turbines will operate a small evaporative air conditioner(**e.g. water and ice 10L evaporative may only need 1Kw solar + a turbine** - oddly a "100L bar refrigerator" only requires 2x 40ah batteries and "just/quite" a 1000w inverter and one 400w-600w 12 v AC turbine and 150w solar safely) constantly during daylight and at 1/3 power for an hour after dark on 4x 40ah batteries.
However, such individualised appliance power source supply construction in these two are top end customisation for self purpose.

But a "small properly powerful" alike to the previous mentioned 12v system, a less difficult user system only requiring one heavy household job after another by weather management requires below(in article) as calculated battery bank system is with a 5Kw wind hybrid(3Kw wind - 2Kw Solar rated 48v charging) on a 15 meter tower with two 10Kw pure sine inverters.
However, this can also be calculated to be alike but not as sparse as the 12v system household equipment sizes for a smaller battery bank system.

Personally, i would buy the extension cords(5000w = 22 amps @ 240v) (2500w = 10 amps @ 240v) and hide them with some over-skirting boards fixtures and locks for safety , rather than rewire the house if it came to it with price and domestic electrical fitting work law.

The full size system of 10Kw hybrid generation is a mimic of having grid power connection, and the 8Kw hybrid generation is an economical mimic of having grid power connection!

The analogy herein this article for these off grid power system sizes is similar metaphorically to the differences between travelling in a v-six cylinder modern station wagon(10-8Kw) 1000Km or travelling in a small 4 cylinder sedan(5-6Kw), with the 12v system(2-3kw) calculated alike travelling 1000km in a hatch back.
Either way you see it , it finally gets you there.

Remember! This is complex by quantity to know, not actual immense science
(but a handling of basic decimal place maths and fractions is a good point)

1. 'Though there are commercial sites that do off grid systems for domestic houses, "UNLESS their calculation for **battery bank size** is done as 25Kw/h - 30Kw/h per day (note: all electrical energy house)" you will have been misinformed by them!

2. The AH ampere hours "total" required "for usage" from the battery bank, for the calculation total is [15% of the total = 25 Kw/h to 30Kw/h] because the bank must last 10 years or more and high quality long float life lead acid are minimum as also Do Not use UPS batteries, they must be deep cycle. (note: When you understand where direct supply comes from , Actually, only 2/3 x(two thirds of OR as carefully managed system half of ...) 25Kw/h - 30Kw/h = 15%).

With this information you should be able to have 12 years of electricity using as little as an 8Kw hybrid and high quality accumulators(batteries) that is no more costly than 10 years worth of grid electricity **"based on current 2014 grid electricity price"!***
At the 8kw kit level it does require a small quantity of heavy load management during usage but does effectively contain twice the quantity of worth of 10 years grid electricity for the 12 year period of 8Kw kit usage (in an "all electric" house - cooking air-con. heating hot-water-system)!
Quote: This article :..."While it is true solar panels continue to operate when sun is behind cloud it is nowhere near as efficient and often drops to 25% output(e.g. 5Kw panels outputs 1.25Kw) particularly on cloudy days and in winter."...

Finally, with the pre-note above in mind on 12v systems by downsizing appliance sizes and running jobs one after another never together, it is possible to design an all electrical small house with "2volt"(not 12) deep cycle(e.g. each a single cell of a 3000ah, around 200Kg, with extra terminals for greater current draw and throughput - so a line of six is 12v and can output 3Kw constant) storage systems to last 12 years(12v is also good for "houses with" gas heating cooking and gas hot water) at half the final costs of an 8Kw kit, but would be better done to get hold of a "48vdc 5Kw wind solar hybrid kit(3Kw-wind 2Kw-solar)" with "two 8Kw pure sine inverters"(prevents too heavy work) and choose 12v deep cycles with 32x accumulators(batteries) (such as only 40ah long life span) meaning it has 8 parallel lines of 4x batteries.
Because, the reserve capabilities of the system for larger jobs in emergency and replacement abilities of extraordinary mishap on batteries if ever, is much safer and easier to manage than 2v sets. A smaller ad-hoc system such as personal holiday houses or extra houses on rural properties or caravans - semi-permanent dwellings is a more effective application of 12v systems,or supplemental abilities to temporarily supply an appliance as power source during a yearly period if required.

Your average electricity bill
Electricity Bill this quarter
My electricity bill is $1,360
****** pending exchange rate being AUD to USD 94 cents at least and "rate during sale" being above 93 cents USD for 1 AUD (note: actual exchange is between CNY and AUD , However, USD is mostly used by the sellers to universally describe price)***

Australia has begun a wind turbine system manufacture that can be applied to domestic power, the "Eco Whisper 325" 5Kw wind turbine PICTURE(20Kw) Eco Whisper information PDF Main Site Eco Whisper, However, it will possibly never be a competitor economically, only "an economic white elephant as a choice" as almost everything built in Australia is governed by standards that are world class not merely its precision construction requirements and materials and accredited licensed human resources(this means with 4 years Tertiary Deg. and a further 2 years for PhD "a spade is most certainly a spade...but is it black or white??? will we ever know...").

For domestic use the average Australian will never be seeing it as an economically viable choice that would cost only 10 years worth of grid for 12 years use in a complete system with twice the electricity(20 years grid usage worth).
Since i am not the Eco Whisper project auditor or financier i do not project it cannot be competitive somewhere in all business considerations however the before-mentioned points need to be considered. Certainly it will not be economically a point for the next half a decade.

If this information were not delivered publicly by a party with "no invested interest"(meaning i have no actual requirement economically as a motive to output this information) in pushing such information you would not be made aware of the fact this method is a cost effective alternative to grid electricity and inclusively solar installers or suppliers of this or any nation.

WARNING to any fool that calls this sites' information commercial or for profit, Money as pricing of off gird power systems is mentioned for proof of theory, parity and clarity and with the comparative context against the unethical national and state

government practice of business monopoly and restriction of use of alternative generator methods probably to favor their inefficient out dated and superseded(by off grid power system delivery modularization) domestic(and in some remote area cases) electricity delivery system called(a sort of showcase south park "precious plum") network grid mains electricity thats' average or projected or prospectivised costs per house/building supplied by network will be equal or greater than that of the cost of an off grid power system to implement and as much collect tax through resale stages down the delivery chain of sale and supply(AKA recombinant tax production). The links to suppliers is again a requirement for people to clearly understand the processes involved and products available as a type of proof the alternative exists. These products prices and actions are part of real time and world to as closely match the whole process to achieve the alternative and make aware that these are all the pieces and are accurately and honestly definitive of what each piece is that truly exists as available! Again no one would mention to new home buyers that posses the space requirements(below) of land that their property choice with a loan they could reduce by 30,000 and maintain the larger loan strategy to bring in their electricity by this alternate!

Note: There should be a web counter at the bottom of this page [If the page does not (load properly) , then press F5 key to reload page]

Nothing could be ruder than being 1 Kilometer from any mains network grid outlet in Australia and quoted ¤30K (thirty thousand dollars) costs

to simply put in the supply to the premises without consuming any before ¤30K is paid down to (¤10K for shorter distances).

So below in this DIY and self imported estimation that has taken one and a half years of research to produce,

why not buy 10 - 14 years worth of twice the quantity of electricity for less!

At 15K dollars connection charge a mildly remote house(500 meters away), a bank loan alike housing loan can be a competitive strategy

An average mains grid supplied home with more than two persons will cost approx. 20,000 dollars for ten years electricity

The carbon tax from mains grid electricity takes your money and you consume fossil fuel

The wind solar hybrid actually commits being green renewable clean energy and

(only problem) "required size to RELIABLY supply-generate(weather - cost implementation)"

gives twice the usable electricity (40,000 AUD of electricity, for 26,000 AUD implementation)

Link: What they didn't tell you!!!

In terms of costs loans and taxation, it does not appear anything or government takes any notice of the price of living as neither did the french colonial government of Vietnam when it taxed its peasants for rice until it was impossible to have enough to live upon. One partial story of the origin of the North Vietnam uprising went that before the 1950's uprising the peasant farmers sold their excess rice(rice to live on) to exporters whom would not pay anything much or would then not buy any if as much as a measly cost were its price,then the excess rice would not be sold and go rotten, in turn the french colonial government(relying in part on its tax somewhere in the trade line) then taxed peasants using rice and there was nothing over for the living thus giving Ho Chi Min and others their point as many of them to revolt and commit revolution.

The same mentality by the Australian government appears to be being committed from any party in power in terms of revenue creation, that being taxation without regard to consequence on the idea of Australia as a first world expensive country. The money may be there but its point may not. For example around ten years back i went past a real estate window one evening that had a sign warning the next day all property sales are on the **new sales taxation increased rate**. "Over-night!!!" A 315,000 house that night, was with a sticker over the price the next day , a 420,000 dollar house, 430,000 house that night was the next day a 550,000 house, and any of them had a new sticker over the price. That means at least average "3 years worth more annual wage earner income pay completely and totally" is added to the price which is around six to eight more years loan repayment time.Did anything increase everyones wages 50%??? I bet not!

The solar credits rebate scheme is also available for off grid, however the rebate calculation can only be made by a licensed installer.
However, not to worry, any price you are ever quoted in this country by supply and install for 12 years worth of off grid is not worth the cost against grid.
AND only knowing this DIY self import system can match the grid.

While it is true solar panels continue to operate when sun is behind cloud it is nowhere near as efficient and often drops to 25% output(e.g. 5Kw panels outputs 1.25Kw) particularly on cloudy days and in winter. Australian grid tied solar kits at the proper sensible size of 5Kw are around $6K for the kit only(i am aware some cheaper specials do exist and some subvertive cheaper specials). Installation drives these to around $10K finally. In origin of the grid tie rebate campaign until now, grid tied kits by Australian suppliers were around 15K to 25K fully installed. The main complaint laid in pricing by power producers is the "ongoing infrastructure" required to service long mileage of remote power lines because it is not an automated action, it requires paying humans whom have high level education. It also concedes out of town non suburban power supply is an economic parasite because suburban in town supply only quite makes any money, and the money is actually made by selling to factory industrial.
In summary, this off grid DIY system (where environmentally applicable to its rules) will at least over 12 years be able to regulate your electricity cost.
Queenslands' story of price regulation and "pay back" reliability

Simple wind solar hybrid 12v system example

Some documents links in this article require (PDF) Adobe Acrobat Reader download to use this page.

The Basic Economics of the DIY System

This article is all DIY (Do It Yourself) , if you intend to use a transport company or any extra paid workers then the economic point of the DIY will be lost (unless you are a farmer and have helper employees).

Also, the "Installing" section sets some minimums for both skills and materials which you should have or be able to obtain at a TAFE or adult learning center. Alternative materials to mild steel may be cheaper but should be found on a cost - supply basis.
It is illegal to work on "grid wired housing and physically adjoined premises", however, off grid does not carry any relevance for wiring non adjoined non grid premises,*but , everything physical(mounts, frames , battery housing, inverter housing) can be constructed and put in place ready to be wired(e.g. all the way to the cables layed out and mounted on carry poles too) and an electrician can then be used to join the inverter output to the premises fuse box system(will require getting a new fuse box set) and a "kit set power system" with this previous action will allow full insurance and off grid rebate applicable , bringing the 15Kw kit back to around 20.000 AUD. In terms of electrical education , there are many places on the net such as "youtube videos" that can help understand this type of system. And as much for purpose of legal electrical specifications(not much required) those too can be found on the internet(a little similar to the USA e.g. you can burn yourself down if you want but not if its strata title).

note: "all DIY" Self Imported and self brokered kits price estimate includes batteries and tariff and transport and much of the install materials (prices quoted by a supplier are usually in USD as an intermediary currency and require conversion)

Online Currency converter xe.com
"Basic Loan Repayments" Calculator - for people whom possibly would use finance (randomly taken link from a site)

This costing estimate is "something like" ONLY , it depends the deal you make regardless the exchange rate (principally)

All approx. 50% S - 50% W Hybrids: TOTAL ESTIMATED DIY installed(implemented) "FINAL COSTS" (with GST+tariff and @ Xchange rate for Kit and "high quality" sealed lead acid type accumulators + DIY hire transport and DIY mounting materials)			
Xchange rate affected	10Kw	15Kw	20Kw
X@ 95cents AUD-USD - to CNY	¤22,500 AUD	¤24,500 AUD	¤27,500 AUD
X@ 92cents AUD-USD - to CNY	¤24,500 AUD	¤27,000 AUD	¤30,500 AUD
X@ 89cents AUD-USD - to CNY	¤26,500 AUD	¤29,500 AUD	¤33,500 AUD

Kits+"extra 10kw inverter" are up to 11,500 AUD-USD-CNY , batteries are between 7,000 - 8500 AUD-USD-CNY , making GST+tariff approx. 3,000 AUD at port
(your bank charges and rules for T/T i wouldn't know)

(note: "high quality" sealed lead acid accumulators are the best of least costly - see more below) Price can vary by AUD 1500 by exchange rate(money buying or transaction base rate) and Australian dollar exchange rate value.
In essence, this article explains you require 80 x 80ah deep cycle accumulators at 120vDC-charging system, or 100 x 65ah deep cycle accumulators at 240vDC-charging system. And a final point, at least 120 - 140 x 65ah deep cycle accumulators at "20Kw" 240vDC-charging system.
HOWEVER, it can be squeezed better and less expensive longer lasting with other lead acid battery chemistry types AS SHOWN LATER and with help from some calculators in this article!!!

The Hybrid kit suppliers often do not supply the correct standard and type of battery for this use here in this article of 12 years battery cycle life for general house size(usually, not unless you pay enough), So you must buy the accumulators elsewhere as a trade deal near MOQ. Use the information here to understand the minimum requirements for an economic DIY scheme.

(cheaper cost system) If you can use -task -chore -job timing management in your home...

warning: 6000ah to an absolute minimum 4000ah of 12v of batteries is required for a proper 1 decade of use system : Therefore in such a deal keep the "battery acquirement choice" separate(removed - not related) from the system equipment trade deal and its company

If you have a 2.5Kw hot water element or smaller, and can "always" not use cooking equipment for one hour after using a large quantity of hot water(and is set as off peak) such as shower or bath or washing machine! Also, you must only use 2 saucepan hot plates and 1 other appliance e.g. an oven, or a microwave oven or an accessory grill when cooking is done(only 3 high current draw elements plus basic house lighting and TV(digital) or radio and air conditioner must be on low setting and other heavy jobs must be done one after the other not together (e.g. washing machine or hot water reheat e.t.c.))!
You need only 80 x deep cycle batteries of 65ah size for a 120v system (!not 80ah!) for the 10Kw or 15Kw system.
Finally, if you really want a cheaper system all round, this for batteries and a 5Kw wind turbine with 3Kw of solar and two 10Kw inverters makes the bare minimum with critical usage management.

*** It isn't whether you continually use more electricity than you would use from the grid, it is how well you can generate direct supply to the inverter and charge the batteries but for most charge the batteries on an extremely overcast day or re-generate charge over night from heavy usage at the end of the day! (In essence it can be done by as little as 3Kw wind turbine and 3Kw solar but contains too much battery reliance under heavy current usage at session time)! (in short you could switch everything off and cook for as much as 4 to 5 hours a day drawing current at 5Kw every day when it is sunny or windy. This is the essence of the point)!

*** 10Kw kit generator system is for normal wind areas, and 15Kw is for remote non mountain, inland low wind areas or critical extreme remote locations , NOT simply to get more or less or for batteries! (In essence it can be done by as little as 3Kw wind turbine and 3Kw solar but contains too much battery reliance under heavy usage time)!

*** NEVER use inverters at maximum continuous wattage output constantly more than an hour at a session. for most of each day it should be operating at no more than 50% of it rated continuous output. Higher levels will burn it out sooner - this is the reason for using separate circuit supplies with two inverters not simply one from the kit!

This Link: 5kw-Solar 3Kw-Wind 96vdc system to Sydney port would be 22,000 AUD @ 89cents to USD(23K was an overestimation,the complete implementation after transport and material would be around 24,500 and if using 2x 8Kw inverters probably 23,500 but requires careful usage loading to not trip the circuit breaker when cooking(electric) or doing other high current work) to Sydney port inclusive after GST+Tariff. The estimate is also with 2x 10Kw inverters replacing the offered 8Kw inverter and wrangling a custom tower height of 12 meters not the 8m specified by the kit. So you would talk with them on changing the kit parameters. The batteries are as mentioned in this grey text box and should be high quality long life-cycle lead acid, do not use the offered batteries.

DIY to some people is considered a type of porno, but, "its not like that", really the dirty picture of pricing table up there is only the basic means to end and a definite clear comprehension of the facets of achieving a solar wind hybrid system is required. Hence read all the information in this article.
Or you could be answering and asking some awkward questions about nothing too serious by ignorance and no forethought in an argument you just cannot or will not win with other people no matter how proud your final achievement in DIY.

The main problem with self import(apart money and committing everything at the stipulated time on call) is requiring to fill out some annoying paperwork now done on computer by VPN over the net with customs - ACBPS site for importation(the ICS in CI mode). For most after registration for CCID and ICS, and electronic funds transfer for customs, the N10 import declaration.
(You should have a private computer, personal digital certificate "gatekeeper individual" and internet connection for both email to the supplier sales people and for the "ACBPS customs.gov.au" and its "ICS at www.cargosupport.gov.au")

ICS cargo support system "CI" Client Interactive first time users

"Verisign.com.au individual Gatekeeper" Digital Certificate (required for ACBPS ICS)

Cargo Support ICS first time users

Cargo Support ICS faqs

CI Customs Interactive with individual digital certificate

The inspiration for this article was finding all the pieces for a small system on ebay.com.au but also on ebay , systems as big a 8kw inverter and solar wind hybrid off grid parts collecting at around ¤8000 including enough batteries is ¤14,000 , a bit rough in setup but about all. (that's right! "eight thousand" and "fourteen thousand" NOT "NINETY THOUSAND for 7Kw of solar" , How the hell anyone smiles for 90,000 i have no idea). The cheapest i ever saw in Australia of off-grid system was a 6.5Kw hybrid 5Kw-wind and 1.5Kw solar with battery bank all for ¤35,000 but does not even reach the quantity and quality i have found and written here.

Introduction

**** note: The reason wind power or wind hybrids are often not used is NOISE from the turbine blades, they need to be located at least 80 meters minimum from any dwelling.***
**** note: A power inverter (e.g. pure sine wave inverter) is a device that transforms battery current and voltage from DC to AC with a rated specification of output voltage AC and rated continuous power maximum of Kilo-watts(the "rated surge supply maximum for 10 seconds" is usually twice the rated power)***
83 amps @ 12 volts = 1 Kw
4.1 amps @ 240 volts = 1 Kw
Any products imported that have a total of less than ¤1000 AUD for all costs inclusive transport do not require tariff duty , particularly postal items.

** note: SEALED lead acid NO-MAINTENANCE, VRLA/SLA or AGM batteries are only ever used because risk of explosion from "vented to air" batteries is too risky!!!*

News Nov 2013

Someone should tell them there was an old fashioned electrical appliance called a "tube" (for televisions) and a device with a power dragging electric motor called a tape player which started to be replaced around one decade previous, *the "tube" eats at a rate of least 1Kw input power continuously while on generally and was often on all day(pardon the pun)*!
Graph of the Day: Oz households slash electricity use by 23% (28 November 2013)

Electricity usage drops, prices increase (November 26, 2013)

Canberra?s new energy mantra: Renewables bad, demand good (28th Nov 2013) energy white paper 2012 Australia?s energy transformation

Amount of your latest electricity bill?

Wind Solar Hybrid kits can be got as "CIF" to Sydney Port

14 Dec 2013 (April 2013)

In this "changing" world, there is one thing you can trust for pricing. Government owned privatised companies.(The previous statement speaks for itself).
What was it basically PM Tony Abbott said ? Each average domestic power bill would go down ¤400 dollars a year , or was it ¤200 , anyhow, the costs obviously went down for someone.
There are other factors affecting pricing of whatever is government owned , such as , Budget Deficit , Dollar exchange rate value , required government loan repayments , exports and industry performance and inflation.
And then there is plain raising the price anyhow.

Electricity prices to stabilise as gas faces jump April 2013 (electricity prices go up)

Electricity prices will fall with or without carbon price Dec 2013 (electricity prices go down)

Electricity prices set to drop as European links come into play April 2013 (ALL TOGETHER NOW LADS!!! electricity prices go up and down)

Carbon price fall expected to moderate electricity bills Dec 14 2013 (Electricity prices now being "nonchalant")

The reason for complete kits is all the turbine, controller, and panel voltages match.
NOTE: (VIDEO) SOLAR PANEL DIY WIRING CONFIGURATIONS SOLAR POWER DIY GRID FREE PANELS PHOTOVOLTAIC - YouTube

If you do not use a complete electrical system in your house (e.g. use gas for cooking or hot water) and want to get the off grid power system parts piece by piece, remember to match all together controller voltages to battery bank voltage and turbine input and solar input voltages!!!
A "10Kw three phase 120v-DC-to-240vAC OFF GRID inverter" will suffice with any of these,If your house uses LPG cooking (out of town - not mains gas) and has electric hot water a 4Kw wind turbine and "5kw rated hybrid controller 120v" with the solar intake custom raised to 3Kw can be used for a large house with 60 - 70 80ah deep cycle batteries or if cooking and hot water are LPG then a 4Kw wind turbine and "5kw rated hybrid controller 120v with 1.5Kw solar intake" and 60 x 80ah batteries, However, if your house has a roof mounted evaporation air conditioner the solar intake should be custom raised at the factory to 4kw of panels intake to the hybrid controller and 70 x 80ah batteries used.
If the kit you make or get is 10Kw or less and is 120vDC battery bank or less(e.g. 96v or 48v), and you do not find a problem using timing management for tasks with large current machines such as hot water , and stove-top oven, for around ¤5000 to Sydney port you can acquire to use 80 x 40ah deep cycle batteries of the required quality of 1600-discharge to 30% DOD and usage-chemical life-cycle of 10 years @ 30º Celsius. (*note: the reason for lead acid not gel electrolyte type is because it is cheaper, and because with larger size generator kits the charge/discharge current levels and price for long string sets of 10 batteries(120v DC) or 20(240v DC) requires more sets of series lines of batteries - this one base price at Dec. 2013 is around ¤56 AUD p/piece base price at fulfilled MOQ request - "so e.g. only for 60 pieces would be *vaguely something like* ¤4500 to Sydney port"). This will only give you half the time for using 2 stove and oven(total 3)(This device (8000w/h - 8Kw/h worth) plus some extra is the total 10% - 15% "prospectivised calculated storage buffer" capacity allowed used from the battery bank total p/day) and can only be used during the day simultaneous or one by one after dark(but should always have a lag of 1/2 hour between large current appliance use except the air conditioner). This would bring the cost of a 10Kw hybrid kit down to ¤19,500 AUD @ (92cents AUD-USD) approx.

A note about "wind solar hybrid controllers(the charger)" ...
***particularly if you want to construct your own system by specifications* and import and handle around 8 pick-ups and N10 import declarations receipts and tax-tariff e.t.c.**
Not all controllers are as functional as other models and much the size of wind to solar ratio is the same in all models from china as similar to a standard.
It is possible to have any hybrid controller modified for solar charge capacity "up to" the same quantity as the "rated wind input" charge capacity in watts.
*****1 One particular interesting feature that is sometimes optional in hybrid controllers for the wind turbine is called "low charge voltage charging function". Oddly it is not incorporate to all chargers and is worth every piece of its existence because it acts similar to MPPT but uses voltages generated by the turbine that are below the battery voltage level and when the turbine is spinning extremely slowly.**
*****2 Another feature is "battery temperature charge compensation function". As you can see from a battery data sheet, the held capacity of the battery and the allowed charging current maximum are different at various environmental temperatures. This is present as standard in many controllers but sometimes not others.**

Solar , wind or hybrid controllers require matching voltages to input AND current(amperage or wattage) levels. With a Hybrid controller there are some features to understand to successfully match input charge of wind turbine and PV panels to the controller.

Here are some specifications taken from a controller that outputs to 96v rated battery bank.

System voltage 96VDC

The basic rating of output of the controller DC for battery bank after processing the input charge. However, the exact voltage relates "float charge voltage" of the batteries.

solar cell 90VDC~200VDC

This is the second most important voltage for solar panels string sets in series. Each line of panels HAS A "PMax." or "Vmp" Maximum Volts, adds together each panel in series until it reaches to just under 200VDC volts DC.

When the panels are added together there often isn't enough to make the wattage Pw(peak watts) allowed by the controller. Add the "total of the wattage of the string of panels it required to match PMax and VOC" in series until you have the correct maximum wattage by as many "series string sets of panels" required, but "not more than the rated wattage of the input" to the controller for PV panels.

open voltage "VOC" 240VDC

This called the VOC sometimes OVC "Open Circuit Voltage". The VOC is the parameter to try to match identically but must never exceed. When all the panels used to make a series line are added together, alike the PMax. the VOC of each panel must be added together and must be just under or the same as the rated VOC here of 240VDC.(note: 240vdc is a coincidence here not related to other things using 240v)

Usable Example Only:
If we have our **Hybrid controller here with these parameters as a 4Kw or 5kw wind plus standard solar wattage,** and request to modify before payment to 4000w solar also at order time to adjust it for similar solar input wattage as extra We could **obtain this panel and use it because it calculates** close to the upper controller operation boundary while not overloading it for this example model.

250W 260W 270W Poly Solar Panel
Port: Guangzhou
Minimum Order Quantity: 10 Piece/Pieces negotiable

(260w) (VMP = 36v) (OCV = 43.9v) (15 Panels)

15 panels x 260 watts each = 3900 watts total

5 panels X 260 watts = 1300 watts

5 panels x 36 volts VMP = 180 volts VMP

5 panels x 43.9 volts VOC = 219.5 volts VOC

Good Example: VMP is 21 volts short of maximum , VOC is 19 volts short of maximum
220w Solar Panel
Port: Qingdao
Minimum Order Quantity: 10 Piece/Pieces

(220w) (VMP = 29.8v) (OCV = 36.8v) (18 Panels)

18 panels x 220 watts each = 3960w total

6 panels X 220 watts = 1320 watts EACH SERIES STRING OF PV PANELS

6 panels x 29.8 volts VMP = 178.8v VMP

6 panels x 36.8 volts VOC = 220.8 volts VOC

WIND VOLTAGE RANGE 90~150VDC

Wind voltage range is a little tricky, Whether measured in amps or watts the controller has a maximum allowance "of max. turbine wattage" as a rating and sometimes it is only expressed as "amps"(current) on either a wind or solar charge controller. You need to match the turbine for both "rated wattage" and "maximum wattage".

As you can see there is a voltage range of 90v to 150v for a DC turbine or rectified AC output. This indicates that either a 110 volt or 120 volt Turbine is appropriate. The turbine should match just near the mid(120) point between the upper(150) and lower(90) values of voltage, if worse comes to worst, then nearer the bottom of it actually e.g. a 96 volt turbine.

Of 2014, here is a controller that DIY part by part is the correct size for operating a home alike having the grid, but either way the generator size is very important to prevent batteries ever being drained below 15% from the top (15% DOD).
High power 8000w 48v Wind&solar hybrid controller charger with LCD Display ,PWM,& Dump load function 3000w wind+5000w solar NOTE: with wind turbines there are always two different ratings "rated" and "Maximum"!!

Note before starting, the companies for both batteries and hybrid power systems mentioned at the bottom of the page are an extensive survey research for best and largest economically comparative to network electricity in Australia of will supply the Kw power level required to compete, there do not appear to be any others in these online commercial catalogs. If the system will last at least twelve years it will be similar to even implementation cost but by 7 years use a hybrid kit is at least the same quantity of electricity against Australian networks 10 years supply approx. Kw/h economically(However, a hybrid kit may be - can be twice the ready supply-usage p/time unit).

One company has 5Kw power generation Grid tie Hybrid sets 2kw-solar and 3kw-wind , that is only suitable for houses that council and neighbors do not mind the noise of the wind turbine and unlikely in city suburbs where that would not be tolerated. NOTE: grid tied is not useful to streets where houses are more than 50 meters(probably only 30 meters) apart because the supply line loses appreciable chunks of the generated energy

back up the line to supply, generally it would take a 10kw grid tie kit that would only produce back 5kw into the grid running at maximum, so they are not a huge point except in villages and very small towns with large house blocks, but well worth it if they are tolerant of a little extra humming noise and is also 24/7 with wind. Beyond 50 meters apart it is not worth grid tie or costs or impending grid prices.

All Australian houses are 15Kw power system minimum(or around 8Kw generator power system requirement if "gas heating,gas cooking and gas hot water" are used).
note: this article only accounts a roof top evaporation air conditioner no more than 3Kw.

A science show once aired on Australian TV boasted they could operate an Australian home off grid using a 3Kw wind turbine generator.
All Australian houses below a small mansion rate 15Kw including flat units if they contain all the below in the table because of cooking and hot water. A house with 5 children could require a 20Kw inverter and minimum 5kw solar and 5Kw wind hybrid. A small mansion would require 10Kw wind and 10Kw solar and 20Kw inverter.
1. Electrical appliance surge does not often remain under 3Kw for many appliances at time of starting.
2. Wind generators only generate when sufficient wind is present, Solar panels only produce a small percentage of wattage during midday hours in summer.
3. The required consumption levels of a standard Australian home require much more reliable quantity of electric generation relating weather cycles (solar or wind).

Link: (PDF) Importation steps and processes from deal to customs warehouse N30 RCR exit after "cleared" (note: schedule 4 mention in this should be "schedule 3" , 4 is the concession type information)

Off Grid practically by cost effective!

Batteries("Accumulators" - a multi cell battery that is rechargeable) are what makes an off grid system (the consolation for price of "an effective size system" and the batteries is twice the electricity for period of operation - so no more switching off the first world until it makes no sense having all those appliances)

What makes this 3Kw system false is the very underpinning technology(batteries - deep cycle) and reasons for their incorporation to the system. "Deep Cycle batteries" are used for large current and voltage storage purpose in this instance and "not UPS batteries(Uninterrupted Power Supply battery for remote telecommunications stations)" because of the required input and output current "handling" levels, if not heavy current(amps) then in a 120v or 240v DC system certainly the high voltage must be conducted efficiently per amp. The most common use of deep cycle Batterys is for electric motors that haul weights such as motorised wheel chairs , industrial 12v hoist or off grid industrial power tool usage. Deep cycle batteries are generally an industrial device because their price and usage will generally be "profitable for circumstance of getting a paid job to occur" not for cheap electricity supply.

A bulk buy of at least 100 batteries does bring the price to something more affordable per battery but is fraught with all "transport costs" (particularly from the customs warehouse in Australia and beyond) and care of equipment (mainly discharge level called DOD, or battery life-cycle to temperature of operation).
Transportation (as said here in this article) is best gained as a "CIF" (Cost Insurance Freight) "trade deal agreement" (personal) using Sea-Ocean Transport as BB (Break Bulk) cargo for these "size of buys" , and China only ships to Brisbane and Sydney Ports (sometimes Darwin) NO Further!!!.

Batteries in an off grid power system are "analogous to fuel in a vehicle fuel tank and mileage" meaning they both run out of fuel and burn or ware out, So at around ¤10,000 for 100 x 80ah batteries(Accumulators) to your door-step you do not want to simply use them by waiting for charge, you must use some of and at least 50% directly from the charger equipment when in use, this means having a big enough wind turbine and enough panels to supply such a quantity. Again too, when weather conditions are not optimum and will not be good for an extended period such as days then it requires a minimum rating of input from the situation to charge the batteries and it is better to have some extra ability in those conditions to commit some reasonable supply of charge into the usage, hence wind power. To make matters worse two problems can occur, 1. the system is located in a low wind average area, 2. It can be a number of days before sun re-appears.

This is now easy to understand why a "15Kw power generation rating system" for a house is the requirement, not simply one or three Kw maximum generation. A 10Kw wind turbine alone would be a minimum and for a low wind area as it will only produce around 1Kw for the wind speed and probably only 8Kw/h for a 24 hour day in a grey heavily overcast day in a low wind area, as much only around 1Kw more with a hybrid with 5Kw of panels. Batteries allow the generated charge to be stored and re-discharged evenly when required particularly if generation output drops below usage output requirement, but do not last forever and can only handle a particular number of discharge cycles before unusable. Also they can only discharge around a maximum of 1/2 half a Kilo-Watt(500 watts) each and around 5Kw for no more than 5 to 10 seconds for surge(hence the channeling by 80 pieces of 80ah "accumulators"(rechargeable multi cell battery) being 8 lines of 10 in 120vdc systems or 4 lines of 20 in 240vdc systems). More than this, battery temperature rising above 20-25 degrees Celsius can lower the lifetime of the lead acid battery to as little as four to five years (see below at the data sheet).

But the final problem is a set of batteries required to match a charger device(solar wind hybrid controller) and a distributor device(power inverter) called a battery bank. A battery bank sufficient to hold some excess reserve charge to operate an Australian house and its appliances for two days is around 400 ampere hours @ 240v which translates to "100 x 12volt 80ah deep cycle batteries".
consider now that this is also 2.3 tonne of batteries at around ¤85 USD cost p/battery at the base cost and around ¤100 to ¤110 per 80ah battery when all transport costs and tariff and GST are applied. A grand total of around ¤11,000 on your doorstep for 100 batteries(transport company as worst case scenario).

This article is about what little can be done to economically compete sensibly with the grid as an alternative. As much because of "cost and economic exchange rate or construction deficit blowout" the minimum is the goal, so lead acid accumulators of some type with at least a sensible 10 year float life-cycle chemistry at a sensible temperature rating is required.
It's not a point to get a quality or type too high and cause cost blowout.

How batteries operate

**Batteries present a problem on one particular feature that is subtle but always present requiring assessment before putting in a system.
Current draw (amperage - wattage) in use!
Off grid "System Storage Voltage" are often any of 48v, 96v, 120v 0r 240v DC(Direct Current).**

**Any "Deep Cycle" battery can only put out a maximum 200w (16amps @ 12v) continuously without damage and this totaled added together in series string for the purpose.
By this effect it is not being used as a deep cycle battery(current capacity safety only) but it must not ever be overloaded to operate the 10-12 years of use.**

**So to best understand measure of how many batteries to have , it requires to understand maximum current draw simultaneously of a normal "all electric serviced house" being nominally 12Kw for medium sized homes and 15Kw for large families or large appliance homes during heavy usage.
So this follows that on series string per voltage can output:
(NOTE!: Continuous output is anything beyond 30 seconds!)
48v = 4 batteries = 800w per string. (18 strings for 15Kw , or, 13 strings (52 batteries) for 12Kw continuous output)
96v = 8 batteries = 1.6Kw per string. (9 strings for 15Kw , or, 7 strings (56 batteries) for 12Kw continuous output)
120v = 10 batteries = 2Kw per string. (8 strings for 15Kw , or, 6 strings (60 batteries) for 12Kw continuous output)
240v = 20 batteries = 4Kw per string. (4 strings for 15Kw , or, 3 strings (60 batteries) for 12Kw continuous output)
(A minimum of VAGUELY 60 batteries are required of 80ah = 4800ah of batteries @ 12v rating (6 cells))
Other factors are duty chemistry explained elsewhere.
(Note: "deep cycling is extremely damaging to a battery" and a "special purpose action" not a special chemistry particularly!)**

**One final important piece of information relating proper battery size and quantity is the classified AH ampere hour size of the battery under "current discharge" conditions.
When discharging a battery of "deep cycle" lead acid type, generally they can handle up to 40amps (1/2 Kw) as "deep cycling" sometimes are manufactured to withstand 50 amps (WARNING this is a deep cycling duty for throwing away after continually draining to(usually average is around 120-160 full discharges only -called "Deep Cycling") max number of 90% DOD discharges - NOT a long period(12 years) power system mode of operation).
What must be understood is 200w is 16 amps and at around 24 amps discharge level the battery AH(Ampere Hour) rating is lowered to e.g. normal 20hour test rating 80AH *becomes 60AH and 5 hour rating* , and at 30 amp discharge level the AH rating of an 80AH becomes 30AH and 1 hour rating e.tc. .... because this occurs too fast for the chemistry on the plates to keep up with the discharge as continuous.
These types of specification change with chemistry type and manufacture type and method of internals and vary greatly , but then so too does price! We can only afford what is required!**

**It should now be easy to understand that if you made yourself a 12Kw house usage size system and you have two 10Kw inverters or even two 8Kw inverters you may need the safety of a minimum of 60 deep cycle batteries no matter the actual AH rating, particularly if you were accidentally to drive it at the possible 15Kw size for a small time.
To understand this last feature better look at the data sheet(PDF) for a battery provided here, and the headings: "Constant Current Discharge Characteristics: A (25 Celsius)" and "Rated Capacity" for the time discharge AH rating.**

Ensuring battery service life

In an off grid system, as mentioned before, batteries storage capacity and lead plate(Kg) are akin to a vehicle fuel tank and fuel. To adjust storage to the correct size for lead acid deep cycle batteries, 10% of battery bank storage capacity is average daily use. 30% DOD is a common capacity measurement and its reason is because the top 30% of battery capacity charge is used for "float charging". To properly account all required storage ONLY 10% of the float at the top (TO 10% DOD) is used because the batteries must last longer than the 30% DOD 1400 discharges(4 years - a days average usage of electricity per discharge). Near to(more or less) 10% is a days electricity usage and discharge is near three times the 30% rating e.g. 10% DOD = 1400 x 3 = 4200 / 365 = 11.5 years while kept under 23 degrees Celsius for most, also, this is impossible because of some summer days and discharge/charge heating internally and will more equal 7 years because of these latter factors of deterioration and chemical aging (but there are ways for a 10 year 20^{o} Celsius life-cycle type to last 9 years).

Remember, size of a battery bank and the quantity of batteries(per series line to make the system DC voltage side) is not simply the storage quantity, it is actually the "allowable discharge current level" and "charging current level stresses from power and temperature through the set of batteries because of battery preservation for life time of the batteries (12 years), not merely the fact that to discharge the stored capacity to a particular % DOD can affect the life time of the batteries.

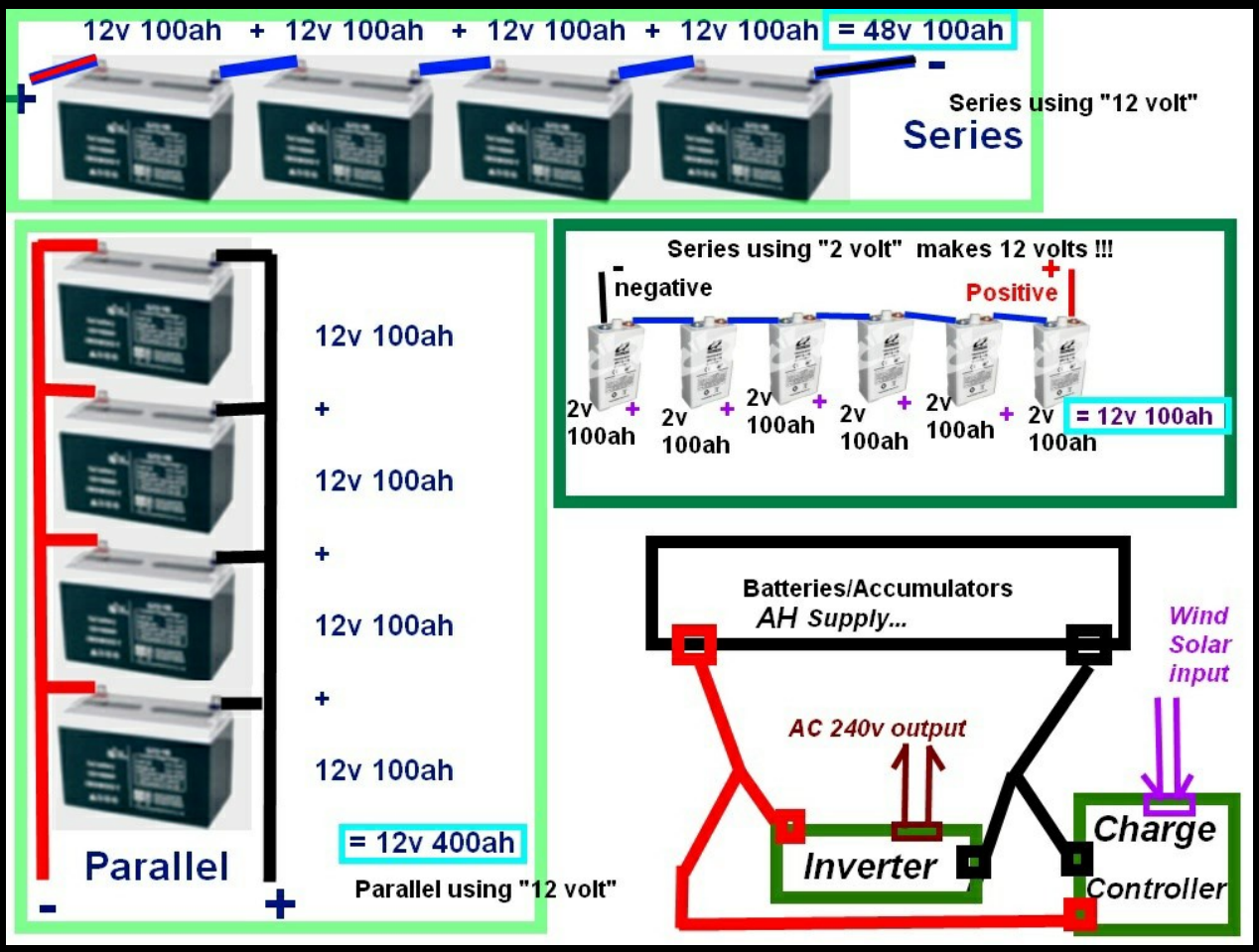
**As example (below here) is this "DOD/ Time Calculator" for a battery bank.
If total battery bank storage amps at 12 volts is 80AH (almost 1Kwh total) (e.g. just one battery) the theoretical time to 30% DOD (1/3 discharge) is "17" minutes of 1Kw.
Then 3 x 17 = 51 minutes , 3 x 30% = 90% of the battery storage size.
The following javascript form calculates the quantity of time a battery bank has if it were being discharged at a constant Kw draw level of current(amperage) use.**

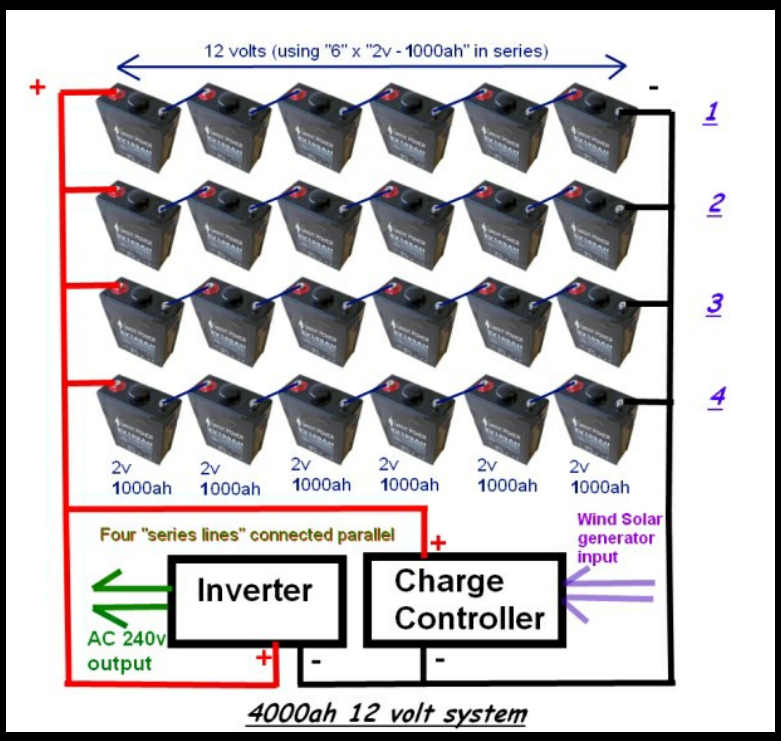
**The average all exclusively electrical energy supplied house in Australia is between 25Kwh to 35Kwh daily,
hence draw at "1Kw"(the select options field) down to 15% DOD should "hypothetically(not necessarily)" equal "at least" around "25 hours" in the decimal-fraction hour field(output answer) in the following form, relating the settings of AH(ampere hours) of battery bank filled into the "battery banks TOTAL 12v worth of AH's" and selection of "@ "X"Kw current draw" selector.**

If you had e.g. 12 x 3000ah "2"volt(not 12) batteries, then 6 batteries in series makes 3000ah of 12 volts, so 12 batteries = 2-lines x 3000ah = 6000ah

TOTAL @ 12 volts.

When batteries are added inline in series the volts are added together and raised, but the AH remain the same.
When batteries are put in parallel, tha AH's are raised but the volts remain the same.





For the storage quantity by 12 volt batteries the total storage is easiest by 12v.
If you have 80 of 12v batteries that are 80ah batteries that makes 6400ah. So if all the 80 were parallel(never do that) the calculator will say you have at "1"Kw , "11.566265060240963" hours = 11.566265060240963 Kw/h's.
By the same point, if our 80ah 12 volt batteries were arranged like next, "8 lines of" --- "10 batteries in series" using 120v power system storage , and we used a calculation for 120v at current(ampere) draw of 1Kw it would be exactly the same!!! "11.566265060240963" hours = 11.566265060240963 Kw/h's. !!!

So you can build any voltage system you want "with 12 volt deep cycle accumulators" but voltage(by battery arrangement) does not and cannot change the quantity of electricity stored!
Just add all the 12v batteries AH ratings together for the total(equivalent to multiplying the AH rating by the number of batteries) , or if you have 2v single cell deep cycle accumulators(batteries), divide by six the total number of batteries and then multiply that number of accumulators by the AH rating they have(they should all be the same! e.g. 3000ah or 250ah or 80ah ... whatever e.t.c ...)

For an actual permanent off grid system, because "14000ah worth of 12v (25Kwh's-15%DOD)" size is too costly(for dedicated 10+ years), and as much the power system can use by management 1:1 ratio(half battery supply AND half wind/sun generator) of "battery bank" to "direct sun/wind generation" can be the day/night efficiency balance when added together, only 6000ah worth of 12v for normal grid mimic is required and around 4000ah for smaller systems the house has had its appliances remodeled for efficiency.

To mention it here (for turbines - for price, it's best to tell the lengths for the - + to the kit supplier to match the turbine Kw and the required lengths) whether kit or you build piece by piece Cable size to volts, amps,watts

[Amps and Watts calculator for System Voltages]
Fill in one field only (numerals only) to calculate!
If you want to find the amps in various system voltages, simply change the volt selector after calculating!
IF you want to find watts "FROM AMPS" again, "set the voltage selector first before" "click-on-clear" a text entry field to rewrite in AMPS again and then using the Calculate button!!!

(Volts) 12v (Amps) AMPS CALCULATE (Watts) WATTS

[Watts is a measure of "job Energy" extremely "alike" Kilo-Joules or Kilo-Calories]

Hours of 240v usage from Lead Acid(Gel/fluid) battery bank storage of 12v Ampere Hours total (By DOD float discharge)
@ "X"Kw current draw 500w [REQUIRED]
Battery Bank in 12v AH **Total** total Input 12v AH here [REQUIRED - numerals only]
Calculate Time (5 years Max) Kw/**Hours** of 240v To (**30% DOD** -hours) (Total in Minutes)
(10+ years) Kw/**Hours** of 240v To (**15% DOD** -hours) (Total in Minutes)

WARNING:

[Always research GEL lead acid for discharges to price , apart normal fluid lead acid type , another is also PAM , it's usually MOQ is the deal problem but ask them]
While the calculation above shows you how much storage in "the basic daily requirement must be available", it does not tell you much about the differences of "Lead Acid type batteries alone" for the purpose of lasting 12 years to 15% DOD , the following calculation can be fed the number of discharges from the specific models' data sheet to convert to years as a decimal fraction.

If the battery is a sufficient quality it will behave something alike double the 30%DOD discharges at 15%DOD.

However, generally only half of the total daily requirement is "one single discharge" for storage (ampere hours) purpose, and in heavy management tactic and modified household refit is calculated as only 1/3rd of the total storage requirement per single discharge for the 12 year period.

calculate years **Number of Discharges to X% DOD** number of discharges **discharges to Years**

4400 discharges is 12 years, 2200 is 6 years.
A six year system of 80x of "40ah" deep cycle GEL to 30% DOD may be a more suitable strategy for some.
with the calculator above the battery bank "3200 AH" time is 23.132 hours total(23Kw/h worth at 30% DOD) per discharge to 30% DOD.
With the data sheet below, we can see it will last 6 years at or below 23° Celsius.
So to use a six year battery strategy, in 5-1/2 years you research and buy another 80x of 40ah accumulators.
One final point to this is 40ah deep cycle are quite small, so best to use not above 120v Battery bank system voltage you choose to order.

There are many chemical combination types of lead acid battery system, relating "Lifespan In Years" because of temperature and chemistry type!!!
*** PAM additive long life lead acid. Link: PAM additive deep cycle**
*** GEL more efficient basic lead acid or with PAM.**
*** Light constructed short life low discharge quantity low temperature operation.**
*** Longer life-span high temperature, heavy construction. Link: Quality GEL lead acid**
*** AGM Absorbed Glass Mat.**
*** Silicon Lead Acid wide temperature operation range.**

These are the common Lead Acid deep cycle types and efficiency varies immensely with ,
*** price (above or below MOQ , company and set quantity) * Note, always buy "EXW" or "CIF"(particularly) only!!! (*sp-note: MOQ - Minimum Order Quantity - e.g. units: "sets" or "pieces")**
*** DOD depth of discharge ratings (shorter float life-span 15%DOD is similar to 30%DOD - long-life 15% is more double 30%)**
*** with temperature-float-lifespan (accumulator model life-span should be more than 10 years always at or above 20° Celsius!)**
*** local environment temperature affected "ah capacity".**
*** current draw "rate of discharge" affected "ah capacity".**

In short, there can be any combination of mentioned above offered , but it is a matter of verifying the price , the model and "data sheet information" are effective at a 12 year job.

You need to be sure it will operate around 50% capacity at 10°C , the float life is more than 12 years at 20°C minimum , and discharge to 30% is at least 1600 discharges , and if a GEL.

In short always ask for an estimate of 15% DOD and 30% DOD and the data sheet, and it always requires a high quality "Lead Acid" to be economic enough.

***As explained later, there are ways of keeping the temperature of batteries at a level that will give more than 10 years "float life" and around 80-90% capacity to charge to.**
RECAP NOTE: Remember as said before, only use a totally sealed battery type, NEVER ventilated to atmosphere!

Here is a "DATA SHEET Example" of a 200AH GEL lead acid battery" (insufficient version), their quality and specifications vary greatly alike the standard sealed fluid lead acid, however they generally have alike twice the discharges of a standard fluid type DOD to DOD comparison. This one is not sufficient because it rated below 10 years @ 20°Celsius

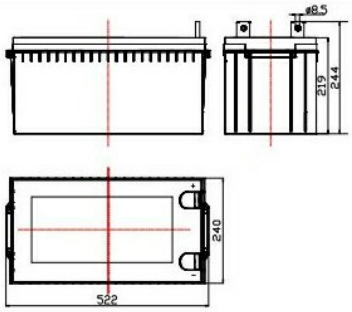
Apologies! (oops blooper!!! this one -removed from link next- was alike the below at 6 years max only http://mdeng.en.alibaba.com/product/1934106484-221514451/2014_Newly_High_Quality_Gel_Battery_12v_80ah.html)

Here is a sufficient version 80ah-100ah GEL http://ciyibattery.en.alibaba.com/ which the "20 pieces M.O.Q." trade lot will be more expensive "per piece" if only 16 were the trade deal (for small 48v or small 96v), but the piece quantity(50) is effectively perfect by discharges for the 120v or 240v(240v would require 60 pieces) 8Kw and 10Kw Hybrid power generator systems to between 30% and 15% over 12 years compared to the high quality lead acids full stop! And another sufficient 80ah GEL (large MOQ trade lot will be more expensive "per piece") http://motoma.en.alibaba.com/

OULITE

LCPC200-12

Jiangsu Oliter Energy Technology Co.,Ltd



Rated Voltage	12V
Capacity(10hr,1.80V/Cell，25℃)	200 Ah
Weight	59kg±0.5
Max.Discharge Current	$30I_{10}$A (3min)
Self-Discharge(25℃)	<3%/month
Using Temperature	Discharge: -45℃～50℃ Charge: -20℃～45℃ Storage: -30℃～40℃
Recommended Using Temperature	15℃～25℃
Designed life	10-13years
Max.Charge Current	≤0. 25C_{10}
Charge Voltage (25℃)	Float Charge:13.5V-13.8V Average Charge:14.4V-14.7V
Cover Material	ABS Engineering Plastic
Charge Mode(25℃)	Float Charge:2.275±0.025V/Cell Temperature Compensation Coefficient: ±3 mV/Cell ℃ Cycle Charge:2.45±0.05V/Cell Temperature Compensation Coefficient: ±5 mV/Cell ℃
Cycle life	100%DOD 572times 50%DOD 1485 times 30%DOD 2406times
Capacity Affected by Temperature	105 % @ 40℃ 85 % @ 0℃ 60 % @ -20℃

"Oliter" LCPC Gel Battery. Maintenance free and easy to use, It can be widely used in solar energy, wind energy, telecommunication systems, off-grid systems, UPS and other fields.

Certifications:
ISO9001
ISO14001
CE
CGC
TLC

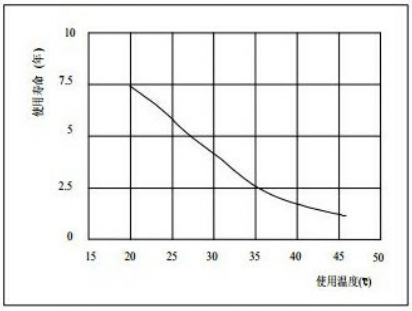
Standards:
GB/T 19638.2-2005
YD/T799-2002
JISC8704-2:1999

OULITE

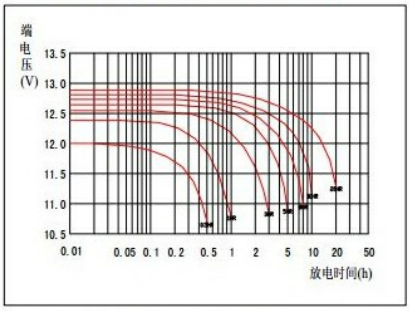
LCPC200-12

Jiangsu Oliter Energy Technology Co.,Ltd

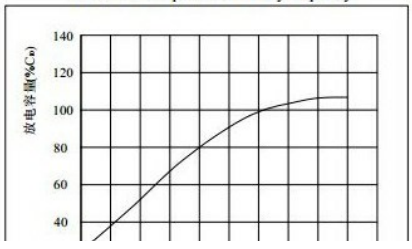
Temperature and Service Life Curve



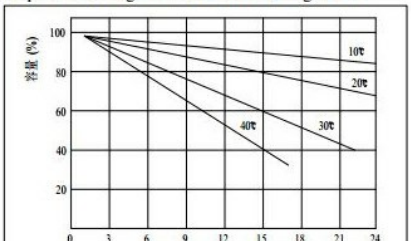
Discharge Characteristics At Various Rates

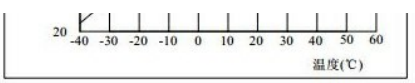


Different Temperature Battery Capacity

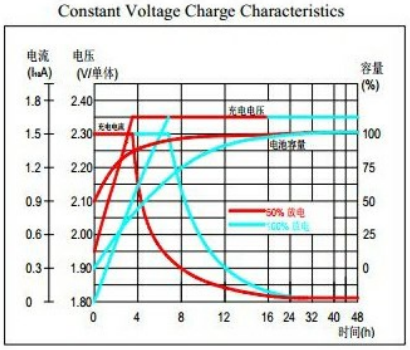


Temperature Storage Time and Self-discharge Curve

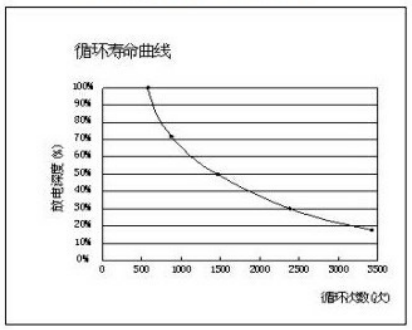




Constant Voltage Charge Characteristics



Discharge Depth and Cycle Life



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Lead Acid Battery types maintenance

Battery cell performance "measurements and units" tutorial

(Quick explaination) "6 monthly" lead acid Battery "Equalising maintenance"

"6 monthly" lead acid Battery "Equalising maintenance"

NOTE: Equalising lead acid batteries should be done in accordance with the requirements stipulated for the "brand" and model with the manufacturers information, "sealed batteries" cannot be chemically tested so ask for the specific information at order time.
*** Some charge controllers come with an "equalisation function", However, as before, ask for the specific maintenance information on equalising lead acids' for the model at order time.**

How to Set a charge controller for the battery model using a Data Sheet

The above data sheet is good problem to show about one of the most important features of a controller in its settings!
A charge controller must have a "settable" "Overcharge-voltage setting" and an "Overcharge recovery setting".
The overcharge setting stops the charger from damaging the battery by overcharging, it switches the turbine to the dump load.
The recovery from overcharge allows the charge controller to charge the battery bank when it's been used a tiny piece and the voltage has dropped according to the setting given to it that is usually only half a volt lower than the "overcharged setting(battery bank is full)".

In short, two main proper sized domestic house "DC system voltages" for 8Kw and 10Kw exist, 120v DC and 240v DC battery bank and hence charge controller!
To make 120v system with 12 volt batteries requires a series line of 10 accumulators.
To make a line of 240v require 20 accumulators(batteries) in series.

(Hypothetical) However, there could have been a bad mishap and lost 2 batteries in a 240v DC battery bank system!!!!!!!!!!!!!
If we take a look at the upper and lower bounds of the allowed charge control input we find we may have a difference of as much as 30v - 40v volts from battery bank full to battery bank drained.
As before a line of 20 x 12v batteries that are empty are 20x 11.2 volts = 224v (lower bounds).

However, our Data sheet above says each cell in the 12v battery(has six cells) is full to "rated AH battery capacity for 100% level temperature" at approx. 14.4v and should be floated at 2.275v p/cell (13.65v * 20 = 273 volts).

14.4v x 20 = 288 volts makes accumulator bank full to "rated AH battery capacity for 100% level temperature".
224 volts is minimum. (*! nearly equalising voltage 4.4v !!!! - should be more like "Overcharged (at around 70%-80% Capacity maximum allowed charge for bank temperature): 18 x 13.5 = 243 volts" - and "Overcharged recovery: 239 volts").

[Hypothetical battery damage emergency situation - series line reshuffle] Removing two batteries on each line so each series line of batteries has only 18 batteries, at full makes 18 x 14.4 = 259.2 volts
When you switch an appliance on, the battery voltage(charge quantity relationship) drops quickly for a moment "called surge or appliance surge" then rises back up to near the closed voltage and slowly drops down with use.

So while you replace the batteries, the system overcharge setting can be "259 volts" and the overcharge recovery can be "258.5 volts" THEORETICALLY.

Data Sheet above: 20x batteries series line = 240v , 7.5 years at 20^{o} Celsius , 100% AH capacity enabled at 20^{o} Celsius
Normal operation is, it should be floated at 2.275v p/cell (13.65v * 20 = 273 volts).
So "overcharge setting" should be 288 volts.
"overcharge recovery" should be 276 volts (13.8v p/battery).
And float should be 272 volts (13.6v p/battery)

Therefore, a battery with 80% capacity of AH's at 20^{o} Celsius, for 15 years life span at that temperature, has its overcharge recovery set at the voltage the battery test outputs at 80% capacity of its rated AH's.
When talking to the supplier about a kit and the controller, ask if it has automatic temperature compensation, whether a built in temperature sensor or if the float and overcharge should be set manually.

Here is an example only: Take a look at the values for: Floating Voltage(V) , Over Voltage Shutoff (V) Over Voltage Recovery(V)

[note: The most sensible and effective system is lead acid accumulator chemistry construction that can handle 30^{o} Celsius rated at 10 years (what it takes to get more than 10 years at 20 degrees), expensive cheap version, simply not cheap, but more worth its point in Australia or equatorial and tropical environments]

Batteries should be kept continually 20^{o} Celsius 24 hours a day, 7 days a week , 365 days a year!!!
Buy and store around 10x of 240vAC supply type 50watt - 100 watt temperature range adjustable fish tank heaters and a 10 gallon plastic fuel container that can be sealed with silicon sealant.

[NOTE: This next paragraph is almost redundant and better sizing tactics and chemistry are now known (80x 40ah batteries for 6 years maybe better as GEL or PAM - then buy another for a six year period in 5-1/2 years when the first are near out of service)]
When acquiring batteries "for the period the first set should be designed to last 7 years"(if not high quality sealed lead acid) at least so either medium or superior lead acid sealed batteries should be used. A medium quality battery has [average 7 years lifespan at 25 degrees Celsius - and - 1400 discharges approximately to 30% DOD]. In power system set lifespan the second set 7 years later may be low quality or another medium quality. Superior quality for 9 years followed by low quality for 4 to 5 years service life is another strategy.
This is why the 10 years at 30^{o} Celsius life-cycle type (high quality sealed lead acid) is the best and basically only choice to use,However, understanding its' capacity% on the LCD screen read out will appear annoying at various temperatures and why a little adjustment in how to encase the batteries with an extra 400w small hybrid system and 100w fish tank heater in a completely sealed plastic 10 gallon fuel drum to incubate the housing or room they are kept, they are often around 75% capacity maximum because of temperature for the chemistry when below 25^{o} Celsius (note, the temperature compensation thermometer is often part of the controller and must be in the same environment as the batteries!!!).

Battery housing and temperature control (a)
(A cooling fan in summer is reasonably optional in the battery housing, however, in winter heating is not optional. For the batteries to maintain usable and chargeable capacity, in winter they must be heated in the battery housing, particularly high quality long life-cycle batteries(only ordinary standard lead acid type accumulator system is viewed in this article because of cost). Reasonably much too, for high quality long life-cycle batteries , they can have double walling, but medium low quality of only 10 years life at 20^{o}C must have triple walling)
About battery operation and data sheets, a point that is required is to normalise the temperature of batteries during use and storage because temperature has a severe effect on life of the battery, it can be as short as 4 or 5 years if above 20 to *"25" degrees Celsius(Some batteries are better than others in this respect and the example is a superior quality lead acid sealed battery compared to most but do not leave it to chance - "life cycle to temperature"). Your battery house should have two fly-wire covered holes of 15cm x 15cm at the top of the wall on both ends of the battery housing to place a 12v fan into one of them for summer heat e.g. a 50watt(4amps @ 12v) or 100w(8amps @ 12v) 12v fan to run from the "load circuit(100w or 200w output dependent model)" (or use a ** "12v DC to 240v AC inverter" and a normal domestic roof exhaust fan - ** note: 12v inverter-controller voltage is very good theft deterrent because only a maximum of 4 12v deep cycle accumulators can ever be put together, because only in parallel and no more than 2Kw output power or it becomes dangerous and damaging to the accumulators - Also it's good for running 100w or 200w tropical fish tank heater set at 22-23^{o} Celsius in a sealed 10 gallon plastic tank in the battery bank housing in winter, In winter close off the air vent gaps and line the walls and roof with card-board as insulation. The high quality life-cycle temperature batteries must have heat during winter, and it will do little against the medium low quality with a life-cycle of only 10 years at 20^{o}C) of a solar hybrid lamp-light controller or (controllers). This you can use a 100w-500w hybrid wind solar kit with a 100w-400w turbine and a small 20w-200w panel and a 12v-10ah battery , use the "load output" circuit from the controller set to the number "always on" in summer months and for much of Australia set to the number "on only for daylight" in winter months(! must be hybrid system). The two holes will require to be blocked off if winter is particularly cold as it is in highland areas.

note: The batteries in use are higher temperature (high quality life-cycle lead acid) batteries 1600 cycles to 30% DOD.
AN EXAMPLE of a parallel 12v set to set up the charge controller parameters for the battery bank:
This means at 20^{o} Celsius "the battery is considered full at 13.6v" because of temperature.(Calculated from data sheet for 2.5v type cell for each of the six cells added together).
At 20^{o} Celsius the battery "capacity in AH is lower in rating" only 80% for the total nominated AH rating of model type of battery (12v 6 cell lead acid).
These were nominally 40AH i was using so they are now 34AH at 20^{o} Celsius.

The Meaning.....:
Should have set the "float-voltage charge" setting to 13.4v
"overcharge" setting at: 13.7v
"overcharge recovery" setting at 13.5v

Battery housing and temperature control (b)
Another critical factor of battery housings for the batteries is the requirement of "triple walling(against infra-red transfer between outer and mid walls) and a triple roof", an outer wall is made to block any direct sunlight as the sun moves over and around the housing. This allows more controlled heat dissipation and blocks the damaging summer heat. These outer cover sections should not be closed to air rain wind(in a context of a perfect seal, except the roof plate of each being water proof and the inner actual housing being wind-rain splash proof), leave an air gap of 10cm each corner or overlap length(as you design it), and should have as little contact with the inner wall as possible "no contact of any form if possible in its construction" (prevent conductance of heat between the inner and outer walls and allow air flow to take away heat). Each wall set should be around one foot(12 inches) apart from each face (a box within a mid box within an outer box principal).

***** Note: (Correct wire) A feature of above is a "small power" 400w or 300w wind turbine, these turbines are often thought by many DIY and people whom need some small electricity supply to be faulty. However, the fault lies in the installers comprehension with a technical problem of wiring. Copper wire in the USA has a standard called #AWG related to the amperage the wire can carry safely, However, its not quite the problem here! The problem is the actual resistance of the wire against current over long distances. Given the above turbines are usually 12 volt(some are 24v others 48v) normal automotive wire can be bought cheap but not effective. So someone thinks to put the turbine up 10 meters, away 40 meters from the house where there are no trees but does not realise 8mm^{2} wire or at least 90 amp 12v wire would be required as minimum to 30 meters. After 20 meters it should be 8mm^{2} copper and larger again to carry charge with low resistance after 50 meters.**
What happened is the 400w turbine is only producing 100w because of normal wind but when it gets to the controller there is only 10w left from the travel because of resistance. The thicker the wire and strands the less the resistance. 6mm^{2} is the usual size to 20 meters.

***** Note: Rechargeable multi cell accumulator cells current direction operates by bias of the throughput from charging and battery engineering physics principally, hence using six 12 volt batteries in parallel is a pure recipe for disaster because as many cells are available in biased power pressure across(a weird but nominally electrically correct short circuit) as there are along (6 series cells x 6 line end(terminal) cells), not up the negative wire and on around through the circuit loop. There must be less parallel lines number of end cells than the series line has cells.**
There is not much worry of that because each line even in a 120vDC rated system is effectively 60 cells of bias and at 12 lines(12 end cells) of "10 x 12v accumulators in series" that's 60 against 12 (or 120 against 12 in a like 240vDC system) for a proper circuit throughput direction. Even then, all that mainly occurs is the very action of how charging batteries occurs if one line is a little weak, it will fill that until it balances to the same voltage pressure, so in effect nothing is exactly wrong.

(Ensuring battery service life) Setting the "Dump Load" on the charge controller and Battery Life-Cycle to temperature and "CA or C" capacity

[note: Remember an Inverter is a device for taking DC battery bank and converting it to AC power supply voltage e.g. 240vac , so 120v or 240v battery bank is DC and the inverter outputs your power supply at the voltage you specified to the supplier at order time]

This is very tricky to explain. But you will need to understand accumulator/battery Data Sheets and their graphs a little

First, a "dump load" is a resistor the charge controller uses to throw away excess produced electricity when the battery bank is full or when the wind turbine is overproducing in heavy wind, or when appliances are not being used sufficiently to draw produced charge(for lack of better expression and simplicity).

There are two features of the battery bank supply for charging to consider from a data sheet of the accumulator you buy and use to set the dump load on the charge controller for long service life.

1. The range of DC battery bank voltage the inverter is allowed to use e.g. a 120vdc "rated" inverter will be allowed something like lower end 110 volts(1.83 volts per cell = 11 volts per battery) to upper bounds 150 volts(2.5 volts per cell = 15 volts per battery)

The reason for this is because when a 12v deep cycle battery is fully charged it measures near 15 volts when full. When near empty it measures 10 volts or less depending temperature and battery engineering parameters of electrolyte type and plate conductor design.

2. The "maximum capacity of the battery at a particular temperature" to match when to set the dump load(if such a setting is ever specifically supplied for programming - usually pre set inside for turbine systems) as a synthetic setting value to commit dumping relating the temperature. On the data sheet can be found a number of graphs some containing a line through the graph and a number and either the letter "C" or "CA" with the number. That number on a graph plot line is a "decimal fraction" of the "C" "C"harge current available or in another graph "CA" the "CA"pacity at that temperature.

So you would for any quality accumulator bank calculate the voltage the bank produces down one series line (e.g. 10 batteries in a 120v system) for the setting temperature to voltage regarding mainly only the quality of the batteries.

This means you would use the produced voltage level at 25 degrees Celsius for good quality batteries to not exceed and the voltage 20 degrees for the low quality batteries. So your bank never charges beyond that voltage.

This means your batteries will last longer because they are not deteriorated by overcharging or charge overloading. Effectively on the number of cycles by rating at any percentage at least it remains as much lead as you deteriorate away by normal usage.

(PDF) High Quality service life The accumulator is rated 10 years at 30^{o} Celsius (High Quality) *** These specifications are the ones to use because they need no cooling and potentially can last 12 years, and only require double walling on their encasing during summer.

(PDF) Medium Quality service life The accumulator is rated 10 years at 20^{o} Celsius (medium quality 1400 - 1600 discharges to 30% DOD) ** This is OK but requires triple walling against direct sunlight in summer.

(PDF) Medium Quality service life The accumulator is rated 10 years at 20^{o} Celsius (a low end medium quality) ** This is OK but requires triple walling against direct sunlight in summer.

(PDF) Low Quality service life The accumulator is rated 8 years at 20^{o} Celsius (low quality) * You would use this type if you were making a small deep cycled system that was moderate in daily discharge e.g. to 40% DOD or 50% DOD "roughly", meaning you understand their life-cycle will be how much you use.

A final note about battery bank sheds and buildings, the temperature sensor for charging level compensation requires the controllers(s) to be in the shed with the batteries so much of the walling system can depend on the side of your house you build the shed onto, but two thing to remember, 1. a line of batteries in series can weigh 150Kg for 120v or 96v series string. 2. The side of the house you build the shed onto depending the direction your house faces and where the generator wires need to run to determine exactly which walls get direct(and in rare circumstance such as bright walls and white concrete reflected light inclusive close walls accross returning infra red) sunlight, and which walls to double or triple wall. If you can, cut a hole in the wall in the side of your house to window pane the controllers behind so the consoles are usable to view for power output (note: some of these controllers can be pre fitted with a computer USB connector info dump to PC and PC software, how far it transmits properly on wires i do not know).

The problem with off grid power

If the size of the off grid power system is enough, NOTHING is a problem except cost of acquiring and installing such a system.

Some difficulties:

1. Large enough power yield panel set to harvest direct power through the charge controller is at least 5Kw of panels , 7Kw rating of panels preferred.
2. Understanding solar panels themselves have varied yield of Kw relating to temperature(not lighting), e.g. over 35 degrees Celsius panel electricity production decreases until 75^{o}C and is only 80% efficient, because of the size of hot water services and stove-ovens at least 5Kw of panels minimum and high end usage of washing and cooking in summer should be between 8am-10am and 4pm-6pm.
Example manufacturer graph information: a. (PDF) Solar Panel research - Pakistan b. Sanyo 210w solar panel - with power efficiency graph information and at 75^{o}C

3. small wind turbines are not favorable below 5Kw because wind speed is often only half the production speed rating of the turbine at best until windy weather. e.g. a 10Kw wind turbine will generally only be producing 1.5kw to 2kw most of the time.

4. wind currents flow faster meters higher the air streams altitudes above ground (from 10 meters and below there is too much slowing turbulence from trees and ground layer air movement) , place the wind turbine higher for greater efficiency. e.g. at 6 meters pole height - 3m/s , at 10 meters pole height - 5m/s , at 15 meters pole height 6.5m/s . The tower on an off grid should always be at least 15 meters high(this is just a point about the percentile(statistics measured points) layers of wind p/meter , low wind areas should really use a large 8kw or 10kw wind turbine generator).

5. Generally there is more wind in summer than winter and there are only 4 hours of good productive light for panels during winter. This means the system must be hybrid and requires at least 5Kw of panels and 5Kw of wind turbine generator.
6. The batteries require to be all exact same model and age with an average DOD rating to 30% of around 1400 - 1600 discharge cycles of use.
7. The batteries will be a transport load of around 2 - 3 tonne.
8. The off grid kit will be around 1 tonne weight, and a 10Kw wind turbine weighs 300Kg , a 5Kw turbine weighs 130Kg (approximate estimate only).
** 9. * The biggest problem is how to safely mount 30 or so 1m x 1.7m panels against gale force wind or large livestock(2.5 meters above ground) and space for the arrays, As much how to raise 600Kg of wind turbine and tower to vertical and seat it solidly.*

A note about inverters (balancing duty load)

One particular problem is inverter output size. At least 10Kw but that requires being extremely careful to not overload it during cooking or hot water use while other appliances are in use. The 15Kw inverter is only half the size of a normal domestic house inverter "found on a network electricity pole(30Kw)". While you can put two "off grid inverters" onto the same battery bank, under no circumstance ever place them on the same circuit for their output. This is because off grid inverters produce the power from the same source and particularly the resonance of the 50Hz systems will not beat in phase. This last point is regardless of transformer types or transformerless inverters, they both need proper power output quality of resonance occurring in phase.

What should be done is have(acquire in the deal) two inverters and put two inverters(pair of: 10kw's or 8kw's or 5kw's) on "two separate different AC output circuit wiring sets" e.g. Hot water, washing machine and its room and air-conditioner on one, the other inverter with the stove hot plates and oven , fridges other rooms e.t.c. .

ADVANTAGE:

The cost of electricity is always rising but because this level of system(15kW) can SAFELY cope with the days when little wind or little sunlight occurs (although a 10Kw 5Kw solar plus 5Kw wind will be OK if you are prepared to be careful of consumption on the few to 2 weeks worth of fays in a year that could occur), it will produce enough electricity for overuse on good days allowing extra showering, cleaning and other activities during sunny weather to 5Kw/h usage, or 3kw usage in windy weather. Water heating no longer has a carbon footprint for washing machines, air conditioners will no longer be paying premium on days over 40 degrees Celsius. More than this, winter is cold and 2Kw of bar element heaters can be used with no carbon footprint.
Because of the much higher size of generator capacity to directly use electricity during battery charging the batteries will discharge much less and allow a longer life of maybe 10 years. In 10 years you will have used twice the electricity you would with mains power. * This is all because on the few days a year when the sun does not shine and the wind does not blow the system MUST KEEP THE BATTERIES AT OR ABOVE 10 percent discharge(DOD) [90% full] or the batteries will deteriorate too fast after.

[(NOTE: The following paragraph is almost redundant in here from newer research and was written as one of the earliest drafts) While the average Australian House is certainly capable of drawing 15Kw all at the one time, "grid mimic" operation cannot be done without having at least two 8Kw or two 10Kw inverters as two different appliance supply circuit systems] 5Kw systems of 3000w wind and 2000w solar with "two 5Kw output inverter" have the point usually only of price but are good for "medium to high wind areas like mountain regions with houses at tops of hills and from 20Km inland to the coastline"(this can be a 10Kw wind only system if it is a high wind average area at the top of a mountain or hill) and more available in 120v battery bank specification by which means battery quantity bought can be 80 batteries of 80ah or larger "ah" batteries.
10Kw inverters only have the problem to not have used the hot water system before using the oven and hot plates for cooking (You cannot load a normal Australian house using only one inverter!!!). When that level of cooking occurs the current draw will only allow an air-conditioner or television and radio and very small appliances to operate while that is occurring because the inverter circuit breaker will switch off the inverter if it gets overloaded. It's just a little easy to do with a 10Kw inverter when hot water or a washing machine and refrigerators are in operation.
Technically only the oven and two hot plate places on the stove are usable because of refrigerator and freezer.

What does it require to operate an Australian house - and with a solar wind hybrid off grid system?

Generally it requires:

1. 15Kw-240vac-50Hz power inverter or either 3-phase or pure sine wave type and for appropriate specified battery bank voltage
2. 100pieces x (12v 80ah deep cycle batteries "SEALED NO-MAINTENANCE VRLA/SLA or AGM") in 5 parallel strings of 20 for 240vdc(volts DC) or 50 150ah deep cycle batteries in 5 parallel strings of 10 at 120vdc(volts DC).
3. A wind turbine generator of at least 5kw "rated power" preferred 8Kw or 10Kw rated wind turbine generator of appropriate voltage and current output rating for the controler-charger.
4. minimum 5kw of solar panels (at 250w p/panel makes 20 panels area) but 7Kw preferred
5. A special charge controller for hybrid system of matching battery bank voltage and matching both the panels and wind turbine voltages
6. appropriate correct specification wiring (able to take the Kw level from the parts and transfer it from the parts)
7. Extra structures to mount panels , house batteries safe from flood and weather , and mount the turbine.

Do not confuse Kilo-Watt(Kw) with Kilo-Watt hours(Kw/h)
example: 1 kw/h is equal to "500w being used for 2 hours".

It requires a "15 KiloWatt power inverter" for almost normal use as minimum compared to the network mains electricity(30Kw power inverter on your street pole) , but smaller carefully managed activities can use a "10 Kilo-Watt power inverter" but will experience difficulty with high current draw activities when many appliances are in use , such as hot water , air conditioning and cooking with hot tops and oven or grill element grate.
The reason is that any appliance but particularly appliances using an electric motors require 5x to 10x the current at normal operating level for a short period of 3 - 10 seconds when starting e.g. a 300w fridge when starting draws 3000w for a second or two and as the motor speeds current draw decreases down to 300w.
The most devious of machines in the house is the washing machine, this is because it commits an action of agitation requiring some surge power every 1-2 seconds causing sudden draw so it tends to use at 5 times its rating and draws 10 times its power under load at start-up.

A typical example of required current (non surge level).

The below table now(updated and changed) has an * asterisk symbol to indicate how untrue current surge and usage value is often shown on other sites information. The highest value is the minimum constant power supply size of inverter should be used.
The below next table has recently been adjusted because of measuring some values and finding them not mentioned properly inclusive the site this table had originated (http://energy.gov/energysaver/articles/estimating-appliance-and-home-electronic-energy-use) from.

Some links relating hot water systems showing "Kw" heater element sizes for models.

(PDF)Dux hot water systems [In acrobat pdf app. press cntrl+F keys and type "Kw" in the search]

(PDF)Rheem hot water systems [In acrobat pdf app. press cntrl+F keys and type "Kw" in the search]

(PDF)Wiring Manual of hot water systems

"vaguely" average required current (no surge)

Air conditioner	3000w
4 stove hot plates/places on high	8000w
oven element	1500 - 2500w
grill element	1000 - 2000w
refrigerator	100 - 700w

freezer	100 - 700w
Domestic hot water system	1.5Kw - 3.6Kw
lighting	500w - 1000w
desktop (large) computer and peripherals	1000w - 1500w
stereo record player-radio	1000w
digital television	200w - 500w
electric frypan	2000w
32Lt Microwave	*4000w peaking
air exhaust fan	300w
washing machine	*4000w peaking
Clothes dryer or bar heater	1500w

Importation deals and How to talk to the supplier

First, You should always buy under "CIF" trade payment terms (actual money transfer is best done by your bank to their bank international T/T). NOTE: It is seriously advisiable to have AUD 2000 more in the account per 10,000 of cost (and much "alike ratio of extra" in tiny online international transfers / payments on express sites e.g. ebay)

CIF means "Cost Insurance Freight", However "freight" only means in this instance to Sydney port or maybe Brisbane or Darwin where ACBPS take over from ship unloading. The only other to use here in DIY import is "EXW" which means "EX Works" which is not quite as described in this instance due to national boundary difficulties. EXW can be likened to CIF without the insurance.

There is a common method of import the big guns use which is called "FOB" , FOB means "free on board" which as you would expect of jargon can bear little relation to what the words are.
FOB means the product is yours and your responsibility when the product is loaded onto your truck and leaves the doors of the factory/warehouse property. No transport or insurance is involved in its price.
FOB is also used as a pick-packing fee notation of getting ready an order.

Talking to the supplier (actually "email only" is best for language reasons)

The supplier sales people obviously do not have perfect English language skills, but good enough if you rephrase anything they did not understand. Neither are they there for a chat and .."hows the weather".. . All you need do is use concise plain English and the EN_us spell checker in Word or OpenOffice to create a clear simple message you wish some pricing and information brochures of their product, then place the message into the "trade site" supplier request form on its advertising page(as ordinary text pasted in).

Here is an example of a message to initiate information relating accumulator products.
However, first you would find the product on a site such as i gained most of this information, alibaba.com and also sign-up into their messaging communication repository system with your email address to use it as a principal method of communication messaging along with message copies to your email address (Yes you do get some basic advertising mail from them but it could perhaps interest you, your not talking nic nac economics anyhow so just ignore it or delete it if it does not interest you, accepting it is politer for both of you).
If you cannot read the information in advertisements properly(there are many language typos) on their site or it does not give clear information or is not a verified supplier, ignore the advertisement, do not bother with asking through that advertisement at least, simply find some other advertisements or supplier giving the required information.

> **Dear sir/madam**
>
> **Do you have 12 volt 40ah - 65ah 80ah deep cycle accumulators with these requirement specifications**
>
> **at least 1400 discharges to 30 percent DOD minimum 10 years life-cycle span usage at 30 degrees Celsius**
>
> **(or minimum 10 years at 25 degrees Celsius)**
>
> **and what would be the CIF 80 pieces quote be for each type if you do have them with the specifications.**
>
> **Thank you.**

Here is an example for a wind Hybrid system to initiate information. The first line is actually part of their trade site page form (..."What is the FOB price on your Wind Solar Hybrid power system,Cheap 20KW wind solar power,Home wind and solar hybrid system."...), NOTE: In numbers refer to a heading on the trade site page of the type of "UNIT" quantity in use for that product e.g. "pieces" or "sets"!

> **What is the FOB price on your Wind Solar Hybrid power system,Cheap 20KW wind solar power,Home wind and solar hybrid system.**
>
> **and What would be a single order (1 set) price of the 15kw 120v 3 phase Hybrid power system(Its MOQ is 2 not one)?**
>
> **The sea port would be either Sydney or Melbourne Australia.**
>
> **Thank you,waiting for reply.**

Just remember its not a point if there is a little extra information or the sentences they use could be constructed better, it does in essence do the job required in context of the product and don't ask too many questions at once per email. It can be a day or two before a reply because they process requests all over the world.
So there is no need for this.

When you place your order, you will often be charged a FOB pick-packing fee and will require often to pay 30% of total cost up front before the pick packing occurs (The supplier will send you the T/T banking information in which account to send money).
When the order is ready, they will then notify you to pay the remaining 70% and any other charges.

When paying, take note of the methods at the top of the advertising page they have in the "trade sites" for the "method of payment". Some use Western Union, T/T or L/C.
However, the most sensible method is T/T from your bank.

Imported Items size and weight and packing method

Both yourself and ACBPS customs needs to know the type of packing and weights each piece of cargo will be (both Net and Gross weights). This you may need to prompt the supplier to tell you when you finalise your order with them before any payment. Remember you can only use sea freight because of cost and the cargo load being extremely heavy. The packaging size and size units and also weight and weight units for each piece whether accumulators on a pallet or a 350Kg wind turbine on a special custom pallet in a wooden carton or the guy wire tower on a pallet in various cartons all need to be accounted for recognition and handling by ACBPS customs and for you to check-sum and handle when you obtain it from the customs warehouse.

As importantly, all that information will be required to be filled in to the "N10 import declaration form" for customs in the ICS electronic Cargo support system.

Money and payment "Personal Import (CCID no ABN)"

Generally, you can use a major bank and TT (Telegraphic Transfer) but there are minor differences to the exchange rate you see on the media and stock exchange financial reporting by types of transfer. When placing an order, sometimes FOB fee is required with the 30% of total goods value is paid before packing the order(usually only the 30% pre paid before packing an order), when that is done and ready, the other 70% is asked for and the goods sent when that last 70% is payed into the suppliers account.
** note: Pricing on commercial export trade sites of China PRC are usually expressed as USD for easier comprehension of cost. Acquiring requires a knowledge of ¤AUD to ¤USD currency exchange rates , international banking methods such as T/T Tele Transfer, bulk buying deals and packing fees F.O.B. fees , CIF (Cost Insurance Freight to sea port only note: China only ships to Brisbane or Sydney ports no others) , port dock handling charges with dock space rent charges, and , GST tax(11%) , customs tariff(5% total value) , CCID Customs Customer IDentity number or ABN. Transportation and pick up charges from freight companies(You should use an appropriate size truck to 4.5 tonne GVM, and lift equipment with your own class C drivers license not a transport company) and handling charges of types such as "lift truck required" at both ends.*

Installing

Required space for a 15 Kw hybrid system is 10 meters x 20 meters ground area(more like 20M x 20M but with 1.5 tonne cable rating each guide cable and set at 10m height on the tower neck would be OK for 10x20), however, solar panels require locating 2 meters above ground at least to prevent large livestock damaging them, on the flip side of this the 15kw kits 30 panels require 3 lines 10 meters long four meters apart each. Apart a hole for each trellis leg 1 meter deep to cement the leg into, This requires 3.0mm x 40mm x 40mm SHS square steel sections of six legs("3 x (3 meter) front" and "3 x (4.5 meter(approx)) back" and "2 x (3 meter) 2.0mm x 20mm x 20mm SHS front sub" and "2 x (4.5 meter (approx.)) 2.0mm x 20mm x 20mm SHS rear sub") each ten meter line of panel mounts, and 4 sub-support legs between p/10 meter line.

The legs should be placed in a hole dug with a post digger 1 meter deep and the hole filled with concrete(with the upright leg in it before pouring in the cement) to hold down the sail structure. To ensure it holds in the cement, drill a hole at the bottom of each leg and place a bolt through it protruding an inch either side to act as an anchor in the cement.

The rest is mainly angle as a rim and some arch support from legs to rim mid points. A final note about the panel row tables, the panels do require backing struts welded in as part of the rim across from top rim to bottom rim, these are to prevent panel compression in gale force winds, all edges of each panel must be fastened down to prevent wind compression - torsion.

The guy wire towers wires require 5 meters at minimum radius points from the center of the tower and 1.5 tonne cable SWL/WLL. Lifting the tower may as well be ancient Egyptian tricks but don't forget before it becomes vertical it can continue to travel down the other side of the lift path past vertical. Second, don't let it sway from side to side or the base where it is pivoting will slip out and down goes ¤5000 of wind turbine.
A 5kw or 10kw wind turbine and tower weigh near to or just over 1 tonne , NEVER try to use a wall to support such a tower , it will simply tear down the whole wall.
note:Lengths of Kw rated electrical wiring(for both either wind or solar) are generally offered in some lengths or custom lengths with these kits as take or leave, so there is nothing like the correct wire for the job.

To economically do all this, learn to weld(Adult learning center or TAFE basic handyman course for welding) with either a MIG or Arc-stick electric welder,Arc-stick electric welder is the better because of the angles you will need to get at the joints on the panel support frame table you build, Generally a cheap "arc stick welder" up to around 130amps "and" an 8Kva generator with 240v-AC-15amp-outlet costs around ¤700-¤800 for both, although a 130 amp gasless MIG welding machine can run with a 5Kva generator or 4 kva generator and or from a 10amp 240v socket at approx ¤600 for both. You should not require beyond a 3.25mm electrode with some 2.5mm electrodes for mild steel.
note: These links to equipment sales and supplies are here to help show exactly the pieces and problem-solutions of logistics of DIY
Gasless MIG welder ebay.com.au
4 Kva portable generator
Wireless 4000LBS/1814kg 12V Boat ATV 4WD Electric Winch AU ¤99.90 - (postage AU ¤34.90 Standard Postage)

Important Install notes:

***- never raise the wind turbine or spin it until it is connected to its controller and the controller is both "on" and "connected to the battery bank" ready. Spinning it without connection can cause internal arcing and destroy the turbine generator.**

***- never use any electric welder on frames and pieces of metal connected to or with close proximate or touching upon the shielding of sensitive electric components or touching any electrical device with earthing wires connected to the welded material. This will or can easily cause damage to circuitry of the other electrical equipment.**

***- Do not connect PV arrays or turbine to the controller until the controller is connected to the battery bank and ready , AND the dump load(good reason for complete kit systems too) resistor system is connected.**

***- Large inverters do not have power sockets, neither are the terminals for the 240v AC circuit output "hot-wire" type as from an inverter transformer electricity grid system, current genuinely always flows one side then back the other way in cycle pairs.**

***- It is a good idea to incorporate a fuse box for each circuit. Some such as the hot water heater circuit may need a 20A fuse wire.**

***- When connecting the air conditioner circuit if its a roof evaporative type, it may be a 240v DC circuit and the connection should happen from one terminal behind its diode box if DC type. The amperage requirements for the model for a fuse need to be determined.**

***- When placing the wind turbine on top of the mounting area, (regardless whether mounting it on the 3 meter guy tower tube top section or anything else any other way) block the gaps between the wires that leave the turbine base, and always cut a thin rubber gasket and use some sealant to prevent water entering the base of the turbine. As much a windy day and rain can atomise water particles and it can blow in a microscopic mist up many meters of tube to the turbine electric wiring outlet in its base causing corrosion and possibly arcing or short circuit. Always carefully seal those areas and gaps or joints as safe practice or you could lose approximately ¤4000 worth of turbine(a 5Kw) just from that.**

***- It happens to be a good idea(economically) to get the kits below that are with a 12m(or taller if offered) guy wire tower because of cost of building a free stand tower and its requirements. A free stand tower as much for an off grid system should be a minimum of 12 meters high to sit above tree top air current turbulence(and sit in the higher meteorological measured percentile layer of wind).**

***- If you build a free stand tower always remember that to safely hold it up a basic extra of 1/5th of its total length must be underground encapsulated in cement (example: a 12 meter tower is now in effect 1440 cm or 14.4 meters long with 2 meters and 40 cm of it underground encapsulated by cement (at least 1 meter diameter cement each leg or if single pole 1.5 meter radius). 1/5th extra is added length whether a 20Kw turbine or a 300w turbine system) whether a solid pipe base or 3(tripod) or 4 legs of an Eiffel type. Any free stand tower base joiner "must support" at least around 1 tonne of mild steel tower flexing(extremely minimal) in a gale force wind.**

***- Another part of concreting the tower base legs is the hole for each insertion must be at least 1 foot deeper than the tower base length with a ready solid bottom cement. The legs of the tower require to be kept from contact with earth to lower the possibility of a lightening strike. Do not put a lightning pole within 80 meters of the tower. To also assist lightning strike prevention, paint the bare metal of the tower with an outdoor high temperature plastic type paint.**

***- Always obtain the guy wire tower and its parts with the kit, it's the cheapest inclusive having to transport it. The kit will require you to hire at least a 2 tonne van with hydraulic tail lift. Ask the kit supplier if the guy cables are part of the equipment and if any other pieces such as the central and upper cable pole clamps are inclusive (Never presume).**

***- If you require to get and put in your own anchor pins for the guy cables (stabilizer cables). The ground pins should all go 1.5 meters down and be at least encased in cement 1 foot diameter(encasing is also to prevent electrical earthing). Such a pin only need be protruding no more than 30 cm (1.8m long total) above ground and be of extra heavy galvanized tube (e.g. 8mm wall) set in the center of the cement.**

***- guy cables (stabilizer cables) may be in a format of set of 6 or 8 (3 from the top and 3 from the middle, or , 4 from the top and 4 from the middle).**

***- You will potentially need a little help from a hired transportable mobile crane if you do not understand the engineering and safety(particularly delicate valuable loads) of "slinging" lifting actions.("LF" forklift license workcover-NSW theory booklets can help, if you comprehend the engineering reasons in "jibs" and fork "load center distance with height" slinging should not be a problem to you to devise some ancient Egyptian method).**

If that does not inspire you to check first and do things correctly(think it through carefully first and check it is right, "don't ever try" something), maybe this will....

Guy wiring the tower
==========

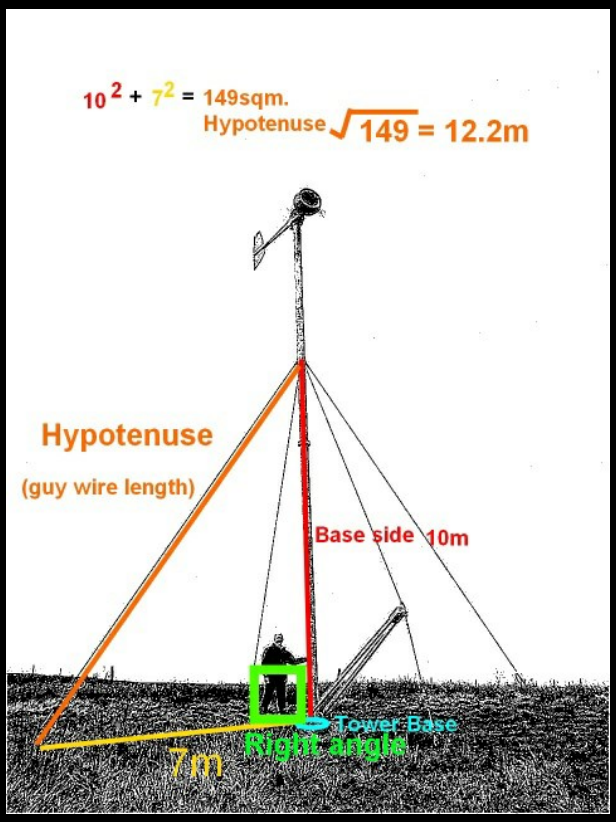
Two things you need to know about setting position of the fastening pegs for the guy wires.
1. The length the guy wires should be.
2. The exact accurate position in the layout the pegs should be placed.
To do this you will need to understand a little simple maths of...
1. Right angle triangles.
2. Equalateral triangles.
But not much if you really don't want because there is undefined extra length you must add for handling to join and tie off at the ends, so accuracy will be easy enough with a short square root method.

First we'll find the guy wire length required(calculator method).
The tower is 12 meters tall but to keep the turbine blades clear of the wires the guy wires will be fastened to the tower at 10 meters.
second, the peg for the first guy wire will be 7 meters away from the base of the tower pole.
With a right angle triangle the "triangle base" is the 10 meter side. The extra side is the 7 meters along the ground to the peg from the tower pole

base.
The wire from up top at the 10 meter point on the tower to the peg is the right angle triangle "hypotenuse".
So to find the length of guy wire required from the right angle triangle rule is:
(7 x7 [is 7 squared] = 49) + (10 x 10 [is 10 squared] = 100) = 149 square meters.
You use the square root of 149 as the absolute minimum length of cable to make any one of the three guy wires.
The square root of 149 = 12.2 meters is an upper guy wire length.
Square root calculator

Finding the guy wire length by non calculator method apart a piece of string, although you can take the string length and added extra for joining to wherever you get cable from chopped, but this is usually unpractical and you need to get a cable each of the correct minimum length with some handling and joining extra length on it.
For mathematical aberrant accuracy sake, it is easy to use the sum of the squares of the other two sides which in the example is 149sqm.
What we do is find the two integer square roots thats' squaring results are above and below the examples 149sqm.
You may need to do this with pen and paper but long multiplication at this level is quite easy(easy on a piece of paper or to scratch in the dirt).
12m x 12m = 144sqm (below 149)
13m x 13m = 169sqm (above 149)
To "theoretically as aberration" find the square of 12.5m(12 meters and 50 center-meters)
to examine if it is close to 149 subtract by 169 - 144 = 25
then divide it by 2 and add the remainder to 144 so it is a size that is exactly mid way between the two integer square results representing 12.5 as the root.
25 / 2 = 12.5(incidentally)
12.5 + 144 = 156.5sqm
This now represents an aberrational sizing of square and square root mid way in relational size.
to make the aberrational square root 12.25 to see if it is closer divide 12.5 / 2 = 6.25 to make it only a quarter(0.25 is a quarter in decimal) of the way from 144sqm the result of the lower integer square root 12.
now add 144 + 6.25 = 150.25sqm (that's probably as good as it can ever safely-accurately get to 149sqm as relational)
12 meters and 25 center-meters appears to be the basic length required to add joiner and handling extra to for the guy wire.
Always use the closest above size for this rough accuracy trick to ensure things reach.

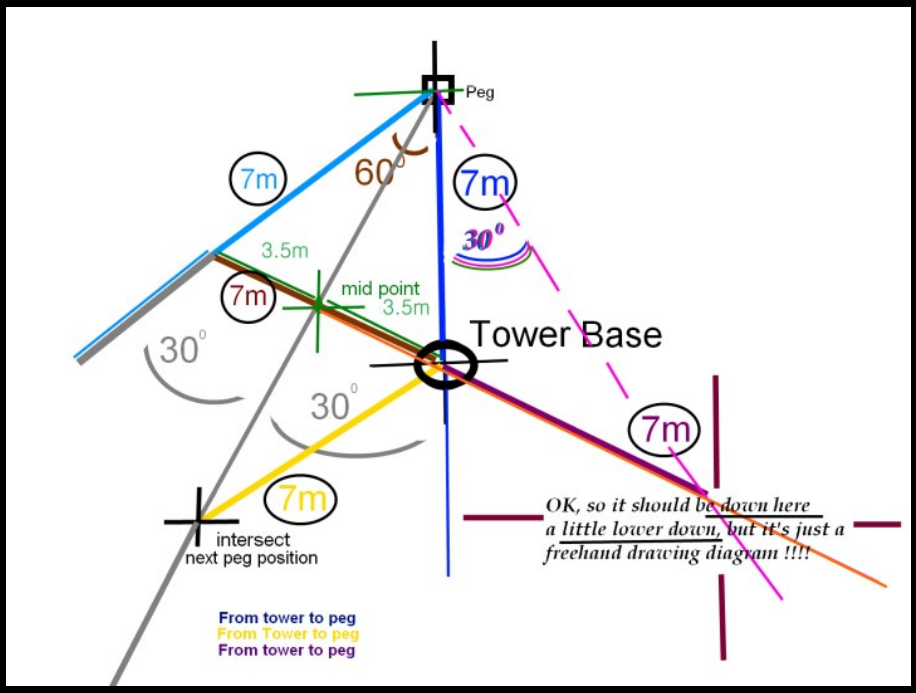
[Note: Motor-homes and caravans can often only cram 400w of solar pv panels on the roof at most, but this is only effective during daylight. With a 300w or 400w wind turbine and a 6.5m long, 50mm diameter(usually the size), with 4mm wall aluminium pole it would add enough to help at battery charging overnight and sundry assistance during 240v output inverter use. Small wind turbines are 5kg to 8kg at the before mentioned watt levels]



Second, we need to know where to place the other two pegs accurately. Oddly because we are using three guy wires around the tower pole we have an easy way if we use an equilateral triangle.
This time we are also partly using ancient Egyptian measuring tricks, but first understand the principle of why to do this using an equilateral!
We need to find the exact point relating both the tower base and the first peg to place the other two pegs evenly apart.
An equalateral triangle has all its internal corner angles(acute) as 60 degrees angle, they are all the same angle.
The sides of an equilateral triangle are all the same length.
This means from the exact mid point between a pair of corners, we could use that point to draw a straight line from it to the third separate opposite triangle corner to achieve it as 30 degrees from that opposite corner point and either side to the mid line we made.
However, we cannot quite do that through the tower base as mid point.
What we do know is that if we were to use the only peg in place we have and we use the tower base position for a straight line it will be one of the sides the same length(7 meters) as the two others we would make if we arrange these two other sides with the peg and base point side all the same length.
You get two pieces of 7 meter rope, stretch both out absolute straight with each touching on one tip and the other two tips, one touches the peg the other tip touches the tower base.
Now we have an equilateral we can use to help create a 30 degrees line from the peg on one side, and again the same action to help make a 30 degrees directed line to intersect the other peg position on the other side.
30 degrees on one side plus 30 degrees on the other side makes 60 degrees, so our starter peg is becoming one corner of a much larger equilateral triangle.

Now "measure the exact(fold to half and place a marker pin)" mid point position on the piece of rope or string touching the tower on one end and touches the other rope on the other tip(mid point of the side opposite the first peg we have in place).
Now place a piece of string around e.g. 9 meters to 12 meters long onto the guy wiring peg and keep it straight as you make a line through that mid point you just found and stretch it out straight for 9 to 12 meters and fasten it down to keep it straight and exactly through the mid point to keep it off shooting at 30 degrees.
Somewhere along the 30 degrees aimed straight line you just made is the point to place one of the other two pegs.
Fasten this new piece of rope or string down about 9 - 12 meters long to hold that angle from the original peg.
Now get a piece of "exactly 7 meter" string and fasten it to the tower base and pull it straight and move with it out straight around the pole above the ground until its tip reaches the piece of string fastened at 30 degrees.
This intersection of the tip and angle setting string is now the point where those two meet and where to place the next peg.

Incidentally, The "mid point"(green in the diagram picture) in the calibrating smaller equilateral is a right angle corner at the point the peg-finder string crosses, but that's not all, if your a nut, because of it, you can do trigonometry using the tower base to first peg line as it is the hypotenuse(7 meters long and 49sqm.) to determine the base side length of the new right angle triangle and multiply by 2x to get the exact length of the new larger equilateral side and simply measure that along the peg setting-finder stretched out string.
However, if your sensible , you can simply use that mid point to first peg length by getting a piece of string and set the length of it from the peg to mid point, then simply extend that length of string from the mid point out further along the 30 degrees setting string to create 2 x the length of the base and that then is the point to place the next peg!
As much again, the distance from the mid point passing as straight line(orange line) through the tower base center at some point intersects the peg position for the other side of the larger equilateral, however(warning), the distance on either side of the tower base are different not equal, so a small equilateral from the first peg and tower base on the opposite side must be used to plot the opposite side line 30 degrees angle but at least that's just "checking" because it is in this example 7 Meters(dark purple line) from the tower base to peg.



Logistics of wiring and Layout
==========
The inverters will need to be as close to the input/output fuse box joined to the entry point of the house wiring because they will need each a pair of wires rated for 10Kw(for 10Kw inverters) , that being 41amps @240v and the same applies to the battery bank housing, needs to be near the inverters with 10Kw DC input (82amps @120v) wire cables pair to the inverters, these wires are huge and cost so as short a run as possible is required.

The controller must be with the batteries because it requires to sense temperature properly to compensate lead acid battery charge characteristics.
Makes a difficulty to view the LCD display, but by "carboard sealed incubation method at around 20 - 23^{O} Celsius" using a temperature settable(on/off auto switching - thermostat controlled model) tropical fish-tank heater, and replacing the heater once a year, the actual charge efficiency is always known unless summer when weather is above 35^{O} Celsius and heat cannot be taken away completely by the triple-wall housing shield system (However, that's only around 30 days p/year and the battery charge level efficiency will be higher).

The run from each series line of panels may be required to be separate and joined at entry to the charge controller, so finding the distance involved and Kw rating of the wire used for take-off carriage is important to know as extra solar cable length and extra wind turbine cable set(2(DC) or 3(possible if AC) cables) can be made part of the trade deal and appropriate #AWG size Kw rating.

* Inverters will need to be properly housed against flooding and weather but with air flow to cool them requiring fly wire close off against insects but also large porous sponge blocks in cavity as air filter.
* (Remember rain hitting the side of an enclosure both bounces up under lids and an oversize(overhang) roof lid should extend at least 40cm down around all sides to prevent splash entry in heavy wind).

Where to locate the Wind Turbine

Obviously as before the turbine needs to be at least 80 meters from dwelling or residences or buildings because of noise.
It also requires placement away from or above obstructions that cause wind loss. To do this use of a number of weather data information sites for your postcode is required.
One such site is bom.gov.au Australia's Bureau of Meteorology site for "Wind Roses".
Wind Roses are a special "graph map" representing the common directions wind comes from "outside a circle toward the central point". The central point is the measurement station location.
Wind Roses bom.gov.au

A second helpful site weather map is a graph of many types of weather statistics by town or postcode as a time line. This has a menu button drop down list to the right top corner of the page that you can use to select or deselect the information shown on the graphic timeline. e.g. wind-speed ,

wind-direction, solar-radiation, precipitation ...
There is also a search bar for locality in the mid top of the page.
It requires Adobe Flashplayer plug-in in your browser.
WeatherSpark graph timeline map

The BOM Calculator allows conversion of different measurement units.

Steps to Acquiring a Hybrid power system

PDF - Customs (ACBPS) Processing Fees and Charges for Import Clearance
PDF - (Customs and Border Protection)Documentary Import Declaration Comprehensive Guide
PDF - 16.1 LODGING IMPORT DECLARATIONS ? NATURE - www.cargosupport.gov.au
Customs Forms

The main problem with self import(apart money and committing everything at the stipulated time on call) is **requiring to fill out some annoying paperwork now done on computer by VPN over the net** with customs - ACBPS site for importation(the ICS in CI mode). For most after registration for CCID and ICS, and electronic funds transfer for customs, the N10 import declaration.
(You should have a private computer, personal digital certificate "gatekeeper individual" and internet connection for both email to the supplier sales people and for the "ACBPS customs.gov.au" and its "ICS at www.cargosupport.gov.au")

ICS cargo support system "CI" Client Interactive first time users

"Verisign.com.au individual Gatekeeper" Digital Certificate

Cargo Support ICS first time users

Cargo Support ICS faqs

CI Customs Interactive with individual digital cerificate

1. Email the supplier and agree on details of the deal and exchange finalised agreement emails with costs and bank details and your details as whom and where the payer is for the deposit to the foreign account(not yours , that will be evident with the identifying depositor details in the bank the money is sent exchanged marked as you on your behalf by the bank).
2. Get a CCID(Customs Customer ID)for customs and taxation use, obtain and assess the overall size and weight of the packing material for transportation from the supplier
3. place official order to supplier as "CIF" (check they do CIF - many do some don't and ExWorks is impossible from China)
4. receive and pay the official order bill of FOB fee , and 30% up front payment with banking fee and currency exchange charges
5. receive and pay the transport and insurance bills when the message the order is ready comes from the supplier
6. use transport dates and packing size-weight to book a transport firm for pick up with "lift loading assistance" at both ends of journey
7. wait for official information of ship docking and unloading date from both supplier and port authority
8. obtain dock handling and dock space rent fees from port authority at the same time customs OK's the load and pay the customs fees and GST and dock rent fees e.t.c.

9. ~~Notify your transport company for pick up~~ XXX Never do the previous its ¤3000AUD (more sensibly hire a 3 tonne van with 500kg hydraulic tail lift gate)
*** Other required equipment is a pallet-jack-trolley , heavy rope, padding carpet patches and three able bodied people.**

(PDF) Importation steps and processes from deal to customs warehouse N30 RCR exit after "cleared" (note: schedule 4 mention in this should be "schedule 3" , 4 is the concession type information)

(PDF) COMPANIES BATTERIES QUOTES (these are about as good as it ever gets, Quotes are usually in USD as a base currency)

(PDF) Typical DATA SHEET from a company MOTOMA 100ah deep cycle "accumulator" (battery) - This tells you the quality of the battery model and its optimum operating conditions

Verisign.com.au GateKeeper digital certificate Type-1

For ICS communication with Internet Explorer using Java applets served from the Itegrated Cargo System customer site,
Buy the digital certificate online then (approx. aud 130AUD).Requires to be physically present at the Australia Post centre for proof of identity check.

Verisign.com.au GateKeeper digital certificate Type-1 (EOI Identity Check At Australia Post shop centres)
Introduction to Digital Certificates
How to import and export personal and CA certificates into and from applications
PDF - Importing your personal certificate(s) to Microsoft Internet Explorer from a Back-up (or export) file

PDF - Digital Certificate and Client Registration Form
PDF - Registering as a client in the Integrated Cargo System
PDF - B301_Consent_to_Obtain_Personal_Information_Form

Java JRE Applet/application Runtime download site

PDF - ACBPS payment system
PDF - ACBPS payment DDR
PDF - ACBPS payment ICS EFT client authorisation
PDF - ACBPS Valuation of goods (refering to N10)
PDF - Visual Examination of Goods application (pre valuation)

LIST OF DOCUMENTS (PDF) - australian customs cargo advices - www.cargosupport.gov.au
Customs Forms
Import Forms
PDF - LODGING IMPORT DECLARATIONS ? NATURE 10

PDF - Import Declaration (N10)

Import Declaration form - **"Tariff Classification No."**

PDF - CUSTOMS TARIFF **SCHEDULE 3**

8502 "(8502.3 - 8502.31 - 8502.31.90 - other generating sets , wind) Electric generating sets and rotary converters" (note only: 8501.61.00 photovoltaic not greater than 16Kw)

8507.20.00 - Other lead-acid "accumulators over 65ah sealed". *(A "primary cell battery" is a throw away battery)*
statistical code unit: 80
Cargo Type: B/B ? BREAK BULK (pallets - wood cartons)
Valuation Basis Type: "Transaction Value - TV" (note: S161 of Customs Act 1901 (CA))
Treatment Code: (schedule 4) ? not dissimilar to next "no applicable concession" - (science organisations, universitys,governments) see "amber reason" if anything.
GST Exemption Code: - "no applicable exemption" for private use - (science organisations, universitys, governments) see "amber reason" if anything.

Goods Description: 12 volt deep cycle lead acid sealed non leakable non spillable accumulators
Goods Description: solar wind hybrid 10Kw off grid power system set

[NOTE: Customs clearance pickup: There is a truck marshaling area , but it is secure and only allowed at allocated time] Normally a load of batteries at this weight costs AUD 1500 - AUD 2500 to freight alone, but, If you have a normal class "C" drivers license you can hire/rent a 4.5Tonne GVM van with tail lift for something like AUD 1000 for three days or less for 24 hours (if batteries and kit arrive the same day or near to you can wait and pay p/day dock rent(arrange first) , as much if your kit totals less or probably near 3 tonne with batteries you can use a 3 tonne van or truck), allowing pick-up after all customs inspection and dock / handling fees GST and Tariff are paid at the docks.]
*** Other required equipment is a pallet-jack-trolley , heavy rope, padding carpet patches and three able bodied people.**

* For the N10 import declaration you should also get/request the name of the shipping line and head office address and the name of the ship and the voyage number. These should be obtained from your supplier, also the first port of entry to the country by the ship and the dates/times for these relevant ports including port of unloading of your goods.

DECLARATION NATURE TYPES - www.cargosupport.gov.au
PDF - Warehouse Declarations Nature 20 (You don't need to know this)
PDF - Import Declarations Nature30
Import Declarations Nature30 - www.cargosupport.gov.au

PDF - Customs (ACBPS) Processing Fees and Charges for Import Clearance
PDF - Fees and Charges for Import Clearance - DAFF
PDF - (Customs and Border Protection - N10 form information) Documentary Import Declaration Comprehensive Guide
PDF - 16.1 LODGING IMPORT DECLARATIONS ? NATURE - www.cargosupport.gov.au
PDF - CARGO REPORTING AND CLEARANCE REQUIREMENTS - www.cargosupport.gov.au
Integrated Cargo System(ICS)and Electronic Data Interchange(EDI)
PDF - Cargo Reporting Timeliness (updated 24 April 2013)

WARNING - (Around 400ah @ 240vdc rating) For 240vdc battery systems use 100 x 80ah batteries 5 strings of 20 in series , for 120vdc battery systems use 50 x 150ah batteries 5 strings of 10 in series ,or, 100 x 80ah batteries 10 strings of 10 in series.

Australia uses "three phase" 240 volt AC 50Hz output. (Modified sine wave is known as "dirty power" because its wave form is too violent as on/off and sensitive low voltage equipment gets damaged, some have a phase/beat switch but some appliances do not)
Generator 3 phase systems refer to an AC alternators' 3 stator coil cores each with a take-off and a fourth output wire to neutral(alike earth pin) from the other end each three.
To harness 3 phase alternator requires a 3 pin input transformer of the middle pin is connected to the center of the input coil and both sides to the center are the same coil length. The output coil side has 2 pins out for wiring.
3 phase power itself is simply the wave form modulation output by three capacitors from the power supply inverter-transformer.

Other interesting notes: A single 12v vehicle or deep cycle battery has enough power to kill instantly, they are not a toy battery, they are an industrial device!
While some electricians know whether they can touch a live circuit, essentially it is bad practice. Never do it.

Wind Solar Hybrid kits can be got as "CIF" to Sydney Port

WARNING: A 3 phase inverter used should be "emulating" 3 phase wave-form with only two output pins the same as a pure sine wave inverter has two live output pins.
Check with supplier first. Pure sine wave is considered sufficient. Modified sine wave(sometimes referred to as simply "sine wave") is not, it is too coarse and can damage equipment.

Foshan tanfon energy technology co.,LTD , 5000w solar + 5000w wind + 10Kw inverter (10k inverter system the loading trick is a get a second 10k inverter(or if they cannot run parallel have that substituted with a 15kw or 20kw inverter of the correct battery bank values at a price) for hot water washing machine and air-cond. to leave the other to the stove-oven)
(PDF) Tanfon old out of date quote paper 5Solar-5Wind
Foshan tanfon energy technology co.,LTD (verified supplier)

Foshan tanfon energy technology co.,LTD , 10,000w wind only + 10kw inverter
Foshan tanfon energy technology co.,LTD (verified supplier)

Foshan tanfon energy technology co.,LTD , 10,000w wind + 3000 solar + 15Kw inverter
(PDF) Tanfon old out of date quote paper 3Solar-10Wind
Foshan tanfon energy technology co.,LTD (verified supplier)

If there is an MOQ(minimum order quantity) more than one you can ask if they will sell one set only and what would be the price, they will tell you if that can be done but it usually means paying more than e.g. half the price would be if the MOQ were two.(note: 3 phase - NOT Single phase)
Suzhou Yueniao Machinery & Electronics Imp & Exp Co., Ltd. , 5000w solar + 5000w wind 10Kw inverter (10k inverter system the loading trick is a get a second 10k inverter(or if they cannot run parallel have that substituted with a 15kw or 20kw inverter of the correct battery bank values at a price) for hot water washing machine and air-cond. to leave the other to the stove-oven)
(PDF) Suzhou Yueniao Machinery&Electronics Imp&Exp Co Ltd old out of date quote paper 5Solar-5Wind
Suzhou Yueniao Machinery & Electronics Imp & Exp Co., Ltd. (verified supplier)

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Suzhou Yueniao Machinery & Electronics Imp & Exp Co., Ltd. , 7000w solar + 8000w wind + 15kw inverter
(PDF) Suzhou Yueniao Machinery&Electronics Imp&Exp Co Ltd old out of date quote paper 7Solar-8Wind
Suzhou Yueniao Machinery & Electronics Imp & Exp Co., Ltd. (verified supplier)

This 20Kw system Only farms with common use of 240v power tools and hoists and pumps would use this. e.t.c.(3 phase - NOT Single phase) is where you would reach "¤30,000 total @95 cents AUD to USD rate(or ¤36,000 @89 cents AUD to USD rate)" if you require to transport batteries around 300Km inland by a transport company, but a good size for farms that use electrical power tool equipment
Suzhou Yueniao Machinery & Electronics Imp & Exp Co., Ltd. , 12,000w solar +8,000w wind + 20kw inverter
(PDF) Suzhou Yueniao Machinery&Electronics Imp&Exp Co Ltd old out of date quote paper 12Solar-8Wind
Suzhou Yueniao Machinery & Electronics Imp & Exp Co., Ltd. (verified supplier)

This is an 8kw system, 3Kw Solar and 5Kw Wind 96Vdc
8kw system, 5Kw Solar and 3Kw Wind 96Vdc Foshan Greentechy Energy Technology Co., Ltd.
(PDF) Old quote brochure 5s-3w - GREENTECHY (CHINA) INDUSTRIAL CO., LTD.
Foshan Greentechy Energy Technology Co., Ltd. alibaba.com

This is an 8kw system, 5Kw Solar and 3Kw Wind
8kw system, 3Kw Solar and 5Kw Wind Shandong Yaneng New Energy Equipment Co., Ltd.
Shandong Yaneng New Energy Equipment Co., Ltd. alibaba.com

Some battery company trade site links you may find useful for the type of battery

12V 75AH RECHARGEABLE LEAD ACID BATTERY - MOQ: 100 Piece/Pieces

12V 40AH RECHARGEABLE LEAD ACID BATTERY - MOQ: 100 Piece/Pieces

Solar battery 12v65ah,battery charger solar 65ah - MOQ: 60 Piece/Pieces

12v 80ah solar gel battery,solar accumulator 12v 80ah - MOQ :40 Piece/Pieces

Solar power gel battery 12v 38ah for flashlight - MOQ :80 Piece/Pieces

***!*!*! 12V 80AH GEL(* if you are not aware of these, much more expensive but longer life - However!!! You must input/output through at least 5 series line sets of accumulators) lead acid solar battery for solar system (Minimum Order Quantity: 10 Piece/Pieces)**

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